Accessing P Class Medicines from General Practitioners or Community Pharmacists:

Investigating User Choice, Substitution and Relative Costs Between the Two Routes

by

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A thesis submitted in partial fulfilment of the

requirements for the degree of

Doctor of Philosophy

University of Edinburgh

College of Medicine and Veterinary Medicine

2004

ADDENDUM

After completion of the research outlined in this thesis, it emerged that there was an error in the community pharmacy cost estimate. Based on information included in the 1998 Drug Tariff, an 'on-cost allowance' (calculated at 17.5% of the Net Ingredient Cost of prescription medicines) was included as an element in the community pharmacy cost estimate. However, this allowance was abolished in 1992. Consequently, the community pharmacy cost estimate was overestimated (by 11-13%) where prescription medicines were obtained. Anyone citing this research or using these estimates should account for this. It is important to note, however, that this overestimation serves only to enhance the relative cost effectiveness of accessing P class medicines from community pharmacists as opposed to general practitioners (as community pharmacy costs are lower) and does not alter the key conclusions of the research.

Declaration

I hereby declare that this thesis has been composed by me and (except where acknowledgement is made) is based on my own work.

Susan Myles

Edinburgh, March 2004

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ABSTRACT

Background - Self-medication using P class medicines has been promoted in recent years. Policy makers believe that this will help to contain NHS costs, as users substitute the purchase of these medicines, over-the-counter from community pharmacies, in place of prescriptions obtained from general practitioners. It is assumed that this will simultaneously secure savings on the NHS medicines bill, dampen demand for general practice consultations and promote more efficient use of scarce primary care resources. These assumptions were, however, unfounded in evidence.

Aim: To assess the extent to which increased availability of P class medicines facilitates substitution between general practice and community pharmacy and the costs accruing to stakeholders as a result.

Objectives: profile users accessing P medicines, investigating patterns of use among different demographic and socio-economic groups; map the access routes adopted by users; assess the extent of substitution between general practice and community pharmacy services; develop a model to predict users choice of access route; and investigate the changing distribution of costs.

Study design: Cross-sectional descriptive study, with prospective follow-up of users. Semi-structured interviews elicited users' routes to access P medicines and the time and resource costs incurred by stakeholders. Costing analyses estimated total, mean and ranges of costs associated with different access routes. Consumers' surplus analysis calculated the net consumption benefits accruing to users facing different time and money costs. Cost minimisation analysis examined the relative costs and efficiency of the alternate access routes.

Participants: 1185 users recruited in 15 community pharmacies in Lothian while obtaining a P medicine, either on prescription or over-the-counter.

Results: ***Substitution***: the majority of users buying P medicines from a community pharmacy successfully substituted this in place of obtaining them on prescription from a general practitioner. However, a fifth of these users subsequently visited a general practitioner also. ***User Profiles:*** Healthy, more affluent users were significantly more and less affluent, iller users significantly less likely to attempt to substitute. ***Costs***: Substitution generated savings for society overall, with all stakeholders benefiting, on average. Resource savings swing heavily towards the health sector. Users were only marginally better off, on average. Time and resource costs were significantly higher among those in less favourable economic circumstances, who perceived themselves not to be in good health, or who were frequent users of primary care. Cost minimisation analysis indicates promoting increased self-medication using P medicines accessed from community pharmacies, as opposed to from general practitioners, enhances technical and allocative efficiency within the primary care sector.

Conclusion: Policies increasing availability of P medicines have improved access for many users and are consonant with encouraging enhanced, graduated access to first-contact services. However, they promote differential access that is systematically related to the socio-economic status of users. Already disadvantaged people are further disadvantaged. Consequently, inverse care is emergent. The challenge facing policy makers is to improve the efficiency of the policy, simultaneously maximising the substitution potential while avoiding the emergence of inequities in access. Making P medicines available free, over-the-counter at community pharmacies to prescription exempt users could potentially realise both objectives. Longitudinal, whole-systems analysis, developing broader socio-economic theories of consumption, are required to inform how best to tailor future policy initiatives in this important health policy area.

POEM

Learning

The best thing for being sad … is to learn something.
That is the only thing that never fails.
You may grow old and trembling in your anatomies,
you may lie awake at night listening to the disorder of your veins,
you may miss your only love,
you may see the world about you devastated by evil lunatics,
or know your honour trampled in the sewers of baser minds.
There is only one thing for it then – to learn.
Learn why the world wags and what wags it.
That is the only thing which the mind can never exhaust,
never alienate, never be tortured by, never fear or distrust,
and never dream of regretting.

T.H. White
The Once and Future King, 1958

ACKNOWLEDGEMENTS

There are many people whom I must thank for supporting me during my PhD studies and the preparation of this thesis.

The Medical Research Council

The study upon which this thesis is based was funded through a Medical Research Council Training Fellowship in Health Services Research. I was enormously privileged by the opportunities afforded to me during this fellowship. It provided me with unrivalled opportunities for professional development, enabling me to undertake a thorough training in health services research and explore the potential contribution that health economists can offer in this area.

The Dept. of Community Sciences, University of Edinburgh

During my fellowship tenure, my academic home was the Primary Care Research Group, General Practice Section, of the Department of Public Health and Community Sciences, at the University of Edinburgh. I am indebted to friends and colleagues there for their support, many of who gave generously of their time to discuss ideas and help me to enhance my theoretical and methodological knowledge. Their lasting gift to me is ongoing collaborations and friendships with a community of researchers of the highest calibre, from a variety of research traditions. Particular thanks are due to Professors John Howie and David Weller for their support during the writing up stage.

My academic supervision was provided by Dr Sally Wyke (Director of the Scottish School of Primary Care) and Dr John Forbes (Senior Lecturer in Health Economics). I thank them both for their input and patience. I extend particular thanks to Sally for her personal as well as professional support.

I am also grateful to a number of external colleagues: Dr Rob Elton, who provided expert statistical advice, reviewing my results chapters with a keen eye; Dawn Sykes,

former Pharmacy Facilitator at Lothian Health, for her assistance in the design and recruitment stages; staff within the Public Health Section at Lothian Health who assisted me in collating local statistics; and staff at the Royal Pharmaceutical Society of Great Britain (Scottish Department) who assisted me in sourcing community pharmacy costs.

I would also like to thank my examiners: Professor Nick Mays (London School of Hygiene and Tropical Medicine); Professor Christine Bond (University of Aberdeen); and Mr Mike Porter (University of Edinburgh). They made my viva stimulating and unexpectedly enjoyable. Their consideration of the research was careful and constructive. My thesis has, undoubtedly, been strengthened as a result of our discussions and debate.

The people who participated in my study

Particular thanks are due to the P medicine users who generously gave up their time to take part. Without them, this study would not have been possible.

My family

My love and thanks to Mum, Dad, Lynn, Leigh and Sophie for their love and support, as always. Heartfelt love and thanks to Kevin. Without you, this would not have been possible.

I dedicate this thesis to the memory of my grandmothers - Edna Myles and Margaret Cochrane - strong women who led the way.

To everyone else who helped. **Thank you very much.**

Introduction

Rapidly escalating health care costs have required health policy makers to reappraise provision of health services, maximising health gain within finite resources. A multiplicity of policy initiatives have been applied within UK primary care to achieve this end including, cost containment, demand management, skill mix and graduated access strategies. Key objectives of these policy initiatives were to better target and meet demand and reconfigure first contact services, enhancing patient access and convenience.

Efforts to optimise skill mix within primary care teams have been particularly pronounced. Recognition of community pharmacy as a valuable and underused primary care resource resulted in early efforts to better utilise their skills. Reclassification of certain medicines, from prescription only medicines (POMs) to pharmacy available (Ps) under the supervised sale of a community pharmacist, was a key policy lever applied to engage community pharmacy within the broader primary care demand management vision. Indeed, this strategy was one of the pioneer primary care demand management initiatives.

Implicit in these efforts was a substitution hypothesis. Policy makers recognised the potentially double substitution opportunity this presented – to move from more (general practitioners) to less (community pharmacists) skilled and costly care professionals and from public (via NHS prescription medicines) to private (over-the-counter) payment for medicines – thereby alleviating pressure on NHS resources by transferring an increasing share of direct health care costs onto consumers.

There was a widely held assumption within the policy and practice literature that promotion of self medication for minor illness would help contain NHS costs, as users substituted the purchase of pharmacy available (P) drugs in place of prescription (POM) medicines obtained during general practice consultations, thus securing savings on the NHS drugs bill and promoting more efficient usage of scarce general practitioner time (Bramstad et al., 1994; Griffin, 1994; Anderson & Schou,

1994; Ferner, 1994; Thomas & Noyce, 1996). However, this substitution hypothesis was unfounded in evidence.

Early research efforts investigating the economic implications of the deregulation of POM to P drugs identified the potential for substantial savings to both users and the health sector (Temin, 1983; Temin, 1992; Ryan & Yule 1988; Ryan & Yule 1990). However, these studies, assumed that substitution *did* occur, an assumption for which there was little evidence.

While there is evidence that utilisation of both prescription and over-the-counter drugs are price sensitive (O'Brien, 1989; Leibowitz et al., 1985; Leibowitz, 1989; Ryan & Birch, 1991; Huttin, 1994) evidence regarding the extent of substitution or complementary usage between prescription and over-the-counter drugs was scarce, contradictory and inconclusive (Blaxter & Britten, 1996). Further, much of the research is quite dated. It is based on either very few drugs or particular groups of users; and many of the studies are American, the results of which may not be generalisable to the UK. However, the key failings of the studies undertaken thus far, are that they are based mainly on retrospective investigations into changes in aggregate prescription data, pre and post deregulation. This approach failed to investigate the complex choice processes and the associated costs and benefits accruing from users' actual consumption behaviour.

In addition, studies investigating substitution between prescription and P medicines typically have failed to identify the mechanics of it and, in particular, whether it was patient or doctor initiated. Yet, these factors are crucial to understanding the extent to which substitution or complementary usage of prescription and P medicines actually exists and in accurately estimating the economic consequences of this.

There are multiple potential outcomes associated with encouraging increased self-medication for minor ailments. P medicines may be used to directly substitute another service (i.e. a community pharmacist in place of a general practitioner); they may be used as an adjunct or complement (i.e. used as well as other services) with

general practice and community pharmacy services used in tandem by users; they may generate additional or new demand, with people presenting with problems they would otherwise have ignored or dealt with themselves (i.e. lay as opposed to professional management); or they may result in duplication between services, with users attending for problems they have already sought advice on from other health professional and/or services (i.e. presenting in multiple treatment settings, rather than just one).

Available evidence suggests that there is no simple relationship between availability of over-the-counter medicines and demand for NHS prescriptions. The assumption that pharmacy available drugs, directly and only, substitute for consultations with general practice and prescription drugs in the management of minor illness is overly simplistic. The interface between self-medication and the NHS is likely to be far more complex (Thomas & Noyce, 1996). Complementary usage of some P drugs and general practice consultations undoubtedly exists. Thus, potential savings arising from reductions in general practice consultations may be less than assumed.

In addition, the limited economic analyses that have been undertaken to date have tended to focus on a particular perspective (for example, the net benefit to consumers, or savings for the health sector) rather than investigating the changing distribution of costs and benefits across all relevant stakeholders and the welfare implications associated with this. To date, no cost benefit analysis of policies encouraging use of P medicines accessed from community pharmacies as a substitute for prescription medicines obtained from general practitioners in the management of minor ailments has been conducted.

Thus, despite current extensive use of both prescription and over-the-counter drugs, we still do not have a clear picture of the kinds of people who use them (Leibowitz, 1989) the factors influencing users' consultation patterns; the extent of substitution or complementary usage between POM and P drugs; the welfare implications associated with changing distributions of costs and benefits as a result; and their impact upon the changing structures of primary care (Blaxter & Britten, 1996).

This information is urgently required to allow general practitioners, community pharmacists, users and health policy makers to assess the potential contribution of increased availability of P class medicines from community pharmacies as one option amid broader efforts to channel users with minor ailments to the most appropriate primary care service provider and inform how best to reconfigure primary care services to deliver policy aims.

Research involving detailed description and analysis of users' consultation patterns in accessing P medicines and on the economic implications associated with this is, therefore, timely and highly relevant (O'Brien, 1989; Kennedy, 1996; Mays, 1994). The research outlined in this thesis addresses these issues.

Organisation of the thesis

Chapter 1 critically reviews literature related to the theoretical and methodological underpinnings of the research. In addition, it synthesises a range of literature relevant for assessing the impact of policy encouraging increased self-medication, substituting pharmacy (P) available in place of prescription (POM) medicines and consequently between general practitioners and community pharmacists. The chapter ends by outlining the aim and objectives of the research.

Chapter 2 outlines the philosophical stance of the research. It then presents the rationales and detail on the methodologies adopted concerning: the choice of the study design; sample(s) selection procedures; the development and processes of data collection; and data analyses strategies.

Chapter 3 addresses the central question regarding the extent of substitution and complementary usage between general practitioners and community pharmacists among users of P medicines. It presents data analyses: profiling the sample; identifying patterns of P medicine use among different socio-demographic and socio-economic groups; maps the routes adopted by users to access P medicines; assessing the extent of substitution or complementary usage between general practitioners and

community pharmacists in the process; and outlines users' views on use of community pharmacies and increasing availability of P medicines.

Chapter 4 presents a model identifying variables predictive of users' choice between the two routes available to access P medicines, and summarises analyses investigating whether there were any significant differences between users opting to visit either the general practitioner or community pharmacist first to obtain their P medicines.

Chapter 5 investigates the welfare implications associated with policy encouraging increased self-medication using P medicines, outlining the changing distribution of time and resource costs accruing to key stakeholders. In addition, it presents the results of modelling exercises exploring the impact on net benefits to stakeholders resulting from numerous policy scenarios. Finally, it addresses the relative efficiency to both users and the health sector associated with accessing P medicines through prescription and over-the-counter routes.

Chapter 6 presents an overview of the research and discusses the findings. It outlines limitations of the theory and methods applied. It then synthesises the results, contextualising them to current policy debates, discussing the 'success' of the policy aiming to encourage substitution between prescription and P medicines and general practitioner and community pharmacist. Finally, it identifies the winners and losers resultant from the policy and outlines implications for future research.

Chapter 1:

Literature Review

1.1 Introduction

The main aim of this research was to assess the impact of policy initiatives encouraging increased self-medication, substituting pharmacy available medicines in place of prescription medicines (and consequently between community pharmacists and general practitioners) in the management of minor ailments within primary care, investigating the changing distribution of costs accruing to key stakeholders as a result.

In exploring the issues around this research, a diverse range of literature was potentially relevant, covering a number of disciplinary areas, including, economics, sociology, pharmacy, health services research and health policy. The initial literature search is outlined in Appendix 1.

After initial immersion in the literature, a number of more focused areas (listed below) were identified as relevant for informing the research. Subsequent electronic searching targeted these areas, alongside hand searching of key journals, scrutiny of a relevant literature index and cross-referencing from sourced papers in a bid to encapsulate relevant literature sources.

The literature chapter comprises two separate sections. The first briefly considers the theoretical foundations and outlines the two main economic methodologies applied in the research: consumer surplus analysis and economic evaluation. The second summarises and critically appraises a range of topics of relevance to the study, including: incidence and response to minor ailments; self-care and self-medication; use of general practice and community pharmacy services; and use of prescription and non-

prescription medicines. Policy relating to concerns to 'manage' and ensure appropriate access to and use of primary care services, and general practice and community pharmacy within this, is then outlined, considering: the extension of community pharmacists' roles; medicine deregulation; and primary care skill mix substitutions. The evidence relating to the efficiency and effectiveness of skill mix substitutions within primary care generally and between general practitioners and community pharmacists specifically is then outlined. The literature chapter concludes by identifying gaps in the current evidence base that underpinned the rationale for this research.

1.2 Relevant theoretical and methodological literature

1.2.1 Consumers' surplus analysis

Consumer surplus is a demand related concept within economics that measures consumer benefit (Call & Holahan, 1983; Tresch, 1994). Demand theory assumes that consumer preferences can be represented schematically using a demand function. In the 1830s, Cournot was the first person to define and draw a demand function. It depicted the simple empirical relationship observed between sales and prices, noting, as a matter of widely held experience, their inverse relationship and thus the negative slope of the demand function (Blaug, 1996). Indeed, the inverse relationship between product price and amount consumers purchased was observed so regularly that this became known as the 'law of demand' (Call & Holahan, 1983).

Just over a decade later (1844) Jules Dupuit, a French engineer, extended the simple demand function introduced by Cournot. His primary theoretical contribution was to recognise the distinction between total and marginal utility (satisfaction) derived by consumers in relation to demand prices (Dupuit, 1844; Blaug, 1996). In considering the value to society of publicly provided goods or utilities, Dupuit recognised that the benefits consumers derived from consumption of such goods could sometimes outweigh the price they paid for them (Dupuit, 1844).

Dupuit was also the first theorist to interpret demand as a function of marginal utilities. He explained that the negative slope of the demand function resulted from the fact that the extra utility or satisfaction gained from additional consumption of a particular good or service typically declines (Blaug, 1996). His distinction between total and marginal utility became known as the 'law of diminishing marginal utility' (the decline in extra satisfaction as more is consumed). The existence of income and substitution effects typically observed within consumer behaviour also help to explain the downward slope of the demand function. The income effect refers to the fact that when prices rise (fall),

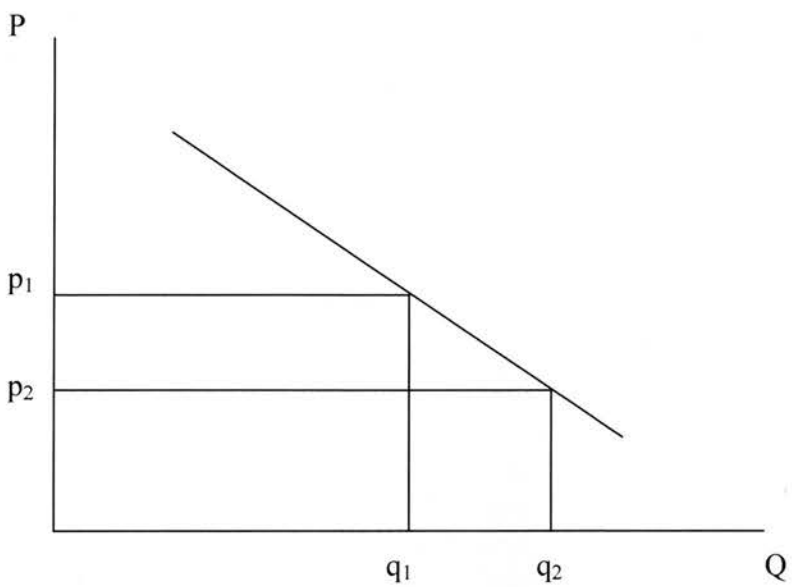
consumers' real income decreases (increases) and demand decreases (increases) due to the fact that existing buyers increase their demand and new buyers enter the market. The substitution effects means that if the price of a good rises (falls), it becomes relatively expensive (cheap) compared to competing goods, therefore, you are likely to get some switching or substitution in purchases and associated decreases (increases) in quantity demanded. The combination of these theoretical developments paved the way for the introduction of the 'consumers' surplus' concept (Marshall, 1920; Call & Holahan, 1983; Ryan & Yule, 1988; Ryan & Yule, 1990; Wonnacott & Wonnacott, 1986; Stanlake, 1976; Blaug, 1996; Lipsey, 1987).

1.2.1.1 Applying consumers' surplus methodology

The application of consumers' surplus analysis can be demonstrated through an example. Figure 1.1 is a simple demand function that illustrates the quantity (Q) of a good that buyers would be willing and able to purchase (demand) at various market prices (P). In analysing demand functions the 'ceteris paribus' assumption is made i.e. that 'other things being equal', everything that affects the quantity demanded, with the sole exception of price, is held constant. The purpose of the demand curve is to show that quantity demanded is affected by price and price alone. Each point on the demand curve measures the maximum price that a consumer would pay for successive units of a good when purchased one at a time. The consumer will pay no more than the marginal benefit of each unit. Total benefit (derived from all units of consumption) is measured by the area under the demand curve (Stanlake, 1976; Call & Holahan, 1983; Tresch, 1994; Pearce, 1983).

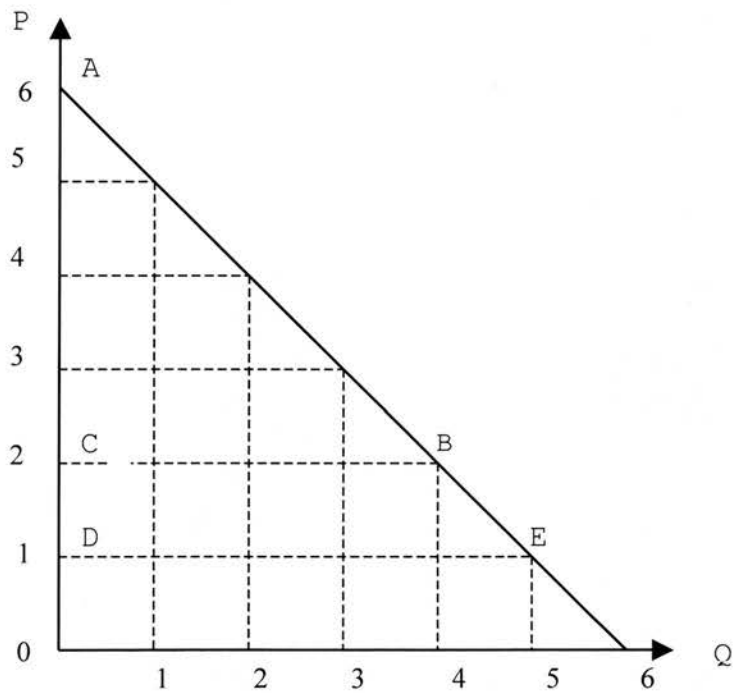
Figure 1.1 illustrates that: at price p_1, quantity demanded is q_1; and when the price of the good falls to p_2, quantity demanded increases to q_2.

FIGURE 1.1: SIMPLE DEMAND FUNCTION



Building on these basic principles, Figure 1.2 highlights the consumers' surplus concept. It indicates that the consumer is prepared to pay £5 to consume their first unit of a good, £4 for the second, £3 for the third, £2 for the fourth, £1 for the fifth and zero for the sixth. Thus, if the market price of the good is £3 per unit, they would buy only 3 units and no more as they are only prepared to pay £2 or less for any additional units.

FIGURE 1.2: ILLUSTRATION OF CONSUMERS' SURPLUS



Consumer surplus measures the difference between the buyer's marginal willingness to pay for successive units of a good and the price they actually pay (Call & Hollahan, 1983; Tresch, 1994; Blaug, 1996). The 'surplus' arises from the fact that the market places the same value (price) on each unit of a good that the consumer purchases, whereas, the consumer places a different value on each unit (as a result of their diminishing marginal utility from consumption) (Lipsey, 1987).

Consumer surplus is particularly useful in evaluating the merits of proposed public projects. Governments typically provide goods and services to consumers who do not pay directly or fully their costs (e.g. health services or subsidised prescription medicines). This can result in a gap emerging between what consumers would be willing to pay, rather than do without the good or service, and what they actually end up paying (Call & Holahan, 1983).

Generally we find that when consumers can buy all the units of a commodity they require, at a single market price, they pay much less for the quantity consumed than they would be willing to pay, faced with the choice between that amount or nothing (Lipsey, 1987). For example, in figure 1.2, the total cost to the consumer of buying 4 units of the good is £8 (4 units at £2 each). However, the demand schedule indicates that, they were willing to pay a maximum of £14 for these 4 units (£5 for the first unit, £4 for the second, £3 for the third and £2 for the fourth). Thus the consumers' surplus is £6 (£14 – £8). This is equivalent to the triangle ABC.

Consumers' surplus can also be used to measure the benefit to the consumer from a fall in prices or costs (Blaug, 1996; Ryan & Yule, 1988; Ryan & Yule, 1990). For example, a reduction in cost from £2 to £1 in figure 1.2 would increase the consumer surplus by the area BCDE.

Indeed, this is the main application of consumers' surplus within this research – examining the net benefits or costs incurred by consumers facing different prices to

access P medicines via alternative routes, either on prescription from general practitioners or over-the-counter from community pharmacists.

At first glance, consumers' surplus appears to be a relatively straightforward concept. However, its application was made slightly more complex when Hicks (1943) highlighted that ordinary demand functions do not account for impacts on income as a result of policy changes and thus may yield only approximate measures of consumers' surplus. He thus refined the theory, advocating that it is necessary to hold real income constant, and proposed two different measures of consumers' surplus – compensating variation and equivalent variation. They differ depending on whether the reference utility for the consumer is before or after the introduction of the policy. Compensating variation adopts the utility before as its reference point and measures the minimum amount of money compensation that would need to be given to the individual after the policy is introduced to restore them to their original utility level. Equivalent variation adopts the utility after the introduction of the policy as its reference point and measures the amount of money that would need to be taken away from the individual prior to the introduction of the policy change to restore their utility to its original level.

In practice, estimation of compensated demand functions is notoriously difficult. If the income effects associated with policy change are believed to be small then there are likely to be only small differences between the two measures of consumers' surplus. This was assumed to be the case in this study. Differential income impacts potentially emergent from encouraging consumers to self-medicate using P medicines are, however, considered within the discussion chapter.

1.2.2 Economic evaluation

Methods of economic evaluation present frameworks for the comprehensive identification of the economic factors involved in decision-making. The basic task of economic evaluation is to identify, measure and compare the costs and consequences of alternatives being considered (Drummond et al., 1987; Drummond et al., 1997; Gold et al., 1996).

The philosophical and theoretical underpinnings of the methods of economic evaluation are firmly rooted within welfare economics. Welfare economics is concerned with the principles for maximising social welfare and economic output. It aims to inform social decision-making by studying the effects of policies on the welfare of society, assessing their relative desirability and making explicit prescriptions, with a view to optimising social welfare. While positive economics seeks to describe how the world works, welfare economics is essentially normative and makes value judgements about how the world ought to work (Gold et al., 1996).

Gold et al (1996) define welfare economics as being 'concerned with the means by which we can assess the desirability – from a societal point of view – of alternative allocations of resources'.

Welfare economics is based on assumptions that individuals maximise a well-defined preference function. A social utility function is defined as some aggregate of individual utilities. Maximisation of the social utility function is the ultimate goal of any resource allocation scheme (Nath, 1973; Gold et al., 1996). Welfare economics investigates the changing distribution of costs and benefits and their potential impact on social utility, resultant from policy changes (Begg, Fischer & Dornbusch, 1991; Coast, 1999).

Early developments in welfare economics can be traced back to the eighteenth century and economists such as Hume (1740s) and Smith (1780s) who began commenting on the appropriate role of government. In the late eighteenth century, Jeremy Bentham began

to consider group or societal welfare, rooted in utilitarian moral philosophy, embracing a theory of social justice that advocated policies that produced 'the greatest happiness for the greatest number' (Brown & Jackson, 1986; Gold et al., 1996). However, it was not until almost a century later in the late nineteenth century (1880s) that continental economists (particularly Italian contributors) began to explicitly analyse the public economy within an exchange framework, exploring issues relating to public expenditure and taxation (Brown & Jackson, 1986).

The founding father of modern welfare economics is commonly regarded to be Pigou (Nath, 1973). Pigou believed that the welfare of society was a summation of the welfare of the individuals comprising that society. He outlined certain 'self-evident truths' including, the assumption that it was desirable to promote social welfare or utility; and his 'equal capacity' principle, which asserted that 'all individuals should be treated as if they had equal capacity to enjoy a given share of income, leisure and welfare' (Nath, 1973).

However, in the 1930s, Lionel Robbins critiqued Pigou's work, particularly his assumptions concerning cardinal measurement of and ultimately direct inter-personal comparisons of utility, which he believed to be incomparable in an objective, scientific way. He rejected the normative approach, believing there to be no place for ethical value judgements within economics. Robbin's work initiated considerable effort on the part of economists to frame ethics-free welfare propositions upon which to base policy evaluation. The result was the re-emergence of concepts such as efficiency and optimality, which were believed to be more neutral, value-free concepts (Nath, 1973).

The next key developments in welfare economics came when economists shifted their attention away from partial to general equilibrium analysis. The partial equilibrium analysis, founded upon the ceteris paribus assumption and techniques of comparative static analysis were useful conceptual and analytical frameworks. Their key limitation, however, was their lack of consideration of the economy as a whole (Call & Holahan,

1983). In contrast, general equilibrium analysis specifically embraced interrelationships within the economy and sought to identify conditions conducive to promoting simultaneously determined equilibria in all markets i.e. general equilibrium (Call & Holahan, 1983).

The Italian economist Vilfredo Pareto was instrumental in developing the theory and application of general equilibrium analysis in welfare economics. Pareto, like Robbins, rejected the strong assumption of cardinal utility and direct interpersonal comparisons; instead embracing the less restrictive concept of ordinal utility, using it to develop a framework outlining the conditions necessary to achieve optimal allocation of a country's economic resources (Nath, 1973).

In a distinct attempt to make economics more objective and scientific, Pareto's model invoked only two 'minimal ethical judgements': (1) that individuals are the best judge of their own welfare; and (2) the Pareto Improvement Criterion which stipulated that social welfare would be enhanced by some policy or change, provided at least one person feels better off because of the change and no one else any worse off (Gold et al., 1996). Applying these assumptions, Pareto demonstrated that optimal conditions of production and exchange could be satisfied. Pareto efficiency is defined to occur when consumer and producer surpluses are maximised and the distribution of resources is such that it is not possible to make anyone better-off without making someone else worse-off.

Economic thought pre Pareto is characterised by a muddy dichotomy between efficiency and equity. Pareto's key contribution was to explicitly distinguish efficiency and equity considerations. He neatly sidesteps interpersonal comparisons and related distributional and equity issues, by restricting his model to consider only welfare enhancing policies (Blaug, 1996). Pareto's definition of welfare maximum was ingenious in that it defined the optimum as one that engenders unanimous approval because it does not involve conflicting welfare changes (Blaug, 1996). By definition, the optimum is achieved only if at least one person is made better off and no one else worse off by the policy change.

As such, it obviates the need for interpersonal comparisons of utility and abandons the notion of a unique social optimum, highlighting the possibility of an infinite number of incomparable social optima (Blaug, 1996). Pareto optimality subsequently became, and remains today, the dominant benchmark within mainstream microeconomics for assessing whether specific policies improve social welfare or not (Gold et al., 1996).

Two primary objections are, however, routinely levelled at the Paretian model: (1) its inability to consider policies that make some better off and others worse off (i.e. the most common policy scenario); and (2) the fact it ignores distributional considerations (by accepting that social welfare can be enhanced by policy provided at least one person feels better off and no one else is any worse off) tacitly accepting the status quo, thereby introducing bias in economic analyses in favour of existing economic conditions and institutions.

Refinement of the Paretian model was, therefore, required if it was to be productively applied to the vast majority of policy changes that generate both winners and losers. This was provided Kaldor and Hicks (Kaldor, 1939; Hicks, 1939). They proposed a modification to the theory to redress the limitation of the Pareto criterion. This was to become known as the Kaldor-Hicks 'Compensation Criteria' (subsequently refined by Skitovsky in 1941). In short, they proposed that a policy change may be regarded as socially desirable if it is possible for the gainers to compensate the losers until they are in a position where they are ultimately both better off.

Kaldor and Hicks argued that such a change constitutes an improvement because it is 'possible' to redistribute welfare gains in such a way that no one loses as a result of the policy change (Gold et al., 1996). It is important to note, however, that the Kaldor-Hicks Compensation Test is a hypothetical criterion. It does not require that the winners actually be required to compensate the losers, merely that they are potentially able to do so (Blaug, 1996).

The Kaldor-Hicks criterion underpins the primary decision rule upon which cost benefit analysis and economic evaluation rests. However, it suffers from the same critique as Pareto's i.e. that it ignores the possible importance of distributional issues that could lead to policies being implemented that favour the rich at the expense of the poor. Efficiency purists argue that policies should be judged primarily on the basis of the Kaldor-Hicks-Skitovsky criteria, addressing issues of distributional justice thereafter. They contend that the role of economic analysis is only to inform policy makers whether particular policies are efficient tools to achieve desired changes, and not to pronounce on the merits of such change (Coate, 2000). Others argue that the function of welfare economics is to explicitly consider applied ethics, rather than avoid it and that it is the duty of the economist to draw attention to efficiency-equity trade-offs (Blaug, 1996). Changes in welfare and their distribution are inextricably linked. For a policy change to be considered to have generated a real improvement in societal welfare, it seems necessary to prefer the second (post-policy) distribution to the first (pre-policy) one. This and other concerns regarding the Paretian model and its usefulness for policy analysis are explored further within the discussion chapter.

1.2.2.1 Applying economic evaluation methodology

The existence of scarcity and thus opportunity cost considerations underpins the need to undertake economic evaluations. Priorities need to be established and choices made regarding efficient ways to provide health care in order to meet needs (Gold et al., 1996; Drummond et al., 1987).

Drummond et al (1997) note that economic evaluations address two main issues – clinical and economic effectiveness. Thus, two key questions underpinning any economic evaluation are: (1) is a health procedure, service or programme worth doing?; and (2) is it worth doing compared with alternate uses to which scarce resources may be employed (Drummond & Jefferson, 1996)? Drummond et al (1997) expand upon these noting that other pertinent questions relevant to most economic evaluations regularly

recur, including: who should do what to whom?; with what health care resources?; and in what relation to other health services?

Economic evaluations evaluate the relative efficiency of different methods of providing health care services, assessing the relationship between resource use, processes and outcomes (Earl-Slater, 1999). Simultaneous assessment, of two particular types of efficiency – technological and allocative – are inherent within economic evaluations. Technological efficiency is achieved by securing the maximum output from the available resources and technology at our disposal. Allocative efficiency addresses the distribution of resources and is achieved when the best combination of goods are produced, that match the priorities of a society, using the lowest combination of resources (Call & Holahan, 1983; Wonnacott & Wonnacott, 1986; Earl-Slater, 1999; Kielhorn, 2000).

Economic evaluations can be classed as either 'partial' of 'full'. Partial economic evaluations tend to investigate either costs or consequences, but not both (Drummond et al., 1997). For example, cost analysis focuses exclusively on cost. 'Full' economic evaluations address both costs (inputs) and consequences (outputs) (Drummond et al., 1997). Four main categories of full economic evaluation exists – cost minimisation analysis (CMA), cost effectiveness analysis (CEA), cost utility analysis (CUA) and cost benefit analysis (CBA).

All four economic evaluation methodologies adopt a common approach in that they all seek to compare the costs and consequences of health care interventions. Further, they all deal with costs in very similar ways. The primary difference between them is the differing, although sometimes subtle, ways in which they measure and value consequences. Table 1.1 below presents the four forms of full economic evaluation and summarises the key differences in their approach to identifying, measuring and valuing consequences (Drummond et al., 1997).

TABLE 1.1: MEASUREMENT OF COSTS AND CONSEQUENCES IN ECONOMIC EVALUATION*

Type of study	Measurement/valuation of costs in both alternatives	Identification of consequences	Measurement/valuation of consequences
Cost-minimisation analysis (CMA)	Monetary	Identical in all relevant respects	None
Cost-effectiveness analysis (CEA)	Monetary	Single effect of interest, common to both alternatives, but achieved to different degrees	Natural units
Cost-utility analysis (CUA)	Monetary	Single or multiple effects, not necessarily common to both alternatives	Healthy years or quality adjusted life years
Cost-benefit analysis (CBA)	Monetary	Single or multiple effects, not necessarily common to both alternatives	Monetary

*Adapted from Drummond et al., 1997

The economic evaluation method adopted within this research is cost minimisation analysis (CMA). It is the most limited form of full economic evaluation (Drummond et al., 1997). However, it is the method of choice when the outcomes (either health or other intermediate outcomes) of the intervention and comparator programmes are assumed to be equal (Briggs & O'Brien, 2001). As such, the decision, and thus the evaluation technique, focuses only on costs and the principal efficiency comparison is made on the basis of cost per identical outcome (Drummond et al., 1997; Gold et al., 1996; Drummond & Jefferson, 1996). Cost minimisation analysis is, however, distinct from the simpler cost analysis method in that it should in fact consider consequences, even if they are ultimately presumed identical (Drummond et al., 1997). Cost

minimisation analyses are particularly useful for considering the distribution of costs and the extent to which they shift between key groups (Gold et al., 1996).

There has been considerable debate among health economists in recent years regarding encouraging 'good' practice in the conduct of economic evaluations within health care settings. This debate has culminated in the production of guidelines or common standards that have been adopted by key academic journals, providing both editors and referees with benchmark standards to inform their critique and encourage systematic appraisal of such research (Drummond et al., 1987; Drummond & Jefferson, 1996; Gold et al., 1996; Drummond et al., 1997).

In the UK, Drummond and colleagues have identified benchmark standards for health economic evaluations. They devised a comprehensive checklist for critiquing economic evaluations. It address three key areas: study design, data collection and analysis, and interpretation of results; which are broken down into ten detailed areas of consideration, which implicitly identify the key stages involved in economic evaluation (Drummond et al., 1987; Drummond & Jefferson, 1996; Drummond et al., 1997) (See Table A1.1 in Appendix 1).

It is unlikely that every study will satisfy all the criteria outlined by Drummond and colleagues. Nonetheless, they offer a useful guide on how to design an evaluation, the critical questions to address and the pitfalls to avoid and are a useful tool to identify the strengths and weaknesses of studies (Drummond et al., 1987; Drummond et al., 1997). As such, the cost minimisation conducted within this study is presented in the Drummond format (within the Methods Chapter) outlining the key methodological and practical issues that merited consideration in the design and conduct of the economic evaluation undertaken in this research.

1.3 Relevant policy, practice and research literature

This section of the literature review summarises a number of factors influencing the use of P class medicines to self-medicate minor ailments within primary care and the resultant substitutions between general practitioners and community pharmacists occurring as a result. It begins by outlining the incidence and management of minor ailments. It then summarises trends in self-care and self-medication; use of general practice and community pharmacy services; and use of prescription and non-prescription medications in the UK. Simultaneous developments in policy, relating to these issues generally, and the promotion of substitution between general practitioners and community pharmacists and prescription and P medicines in the management of minor ailments specifically, are then outlined.

1.3.1 Incidence and management of minor ailments

Minor ailments are variously defined. A variety of synonyms are used including, common, self-limiting and trivial ailments. However, they are generally taken to include conditions that require little or no medical intervention (RPSGB, 2003a). Definitive figures on the incidence of minor ailments within the UK population are hard to find. Sources suggest, however, that 90% of adults suffer from a minor ailment within a two-week period (Whittington et al, 2001) and 94% within the last year (Reader's Digest, 1995).

Sociologists have long studied 'illness behaviour', including responses to minor ailments. Much of the research evidence presented in this section is drawn from contributions from the literature of this discipline. The most common response to minor ailment symptoms is to do nothing and leave them untreated (PAGB, 1997). If people do act to manage a minor ailment, the most common reaction is some form of self-care action. Indeed, most people express a preference to self-manage rather than consult with health professionals, which usually only occurs after self-care efforts (Hassell et al.,

1998; Whittington et al., 2001; Hassell et al., 1997). Survey evidence suggest that one third of minor ailment sufferers treat with either an over-the-counter or prescription medicine they already possess; 9% purchase over-the-counter medicines; and approximately one in seven consult a health professional, most frequently a general practitioner (PAGB, 1997). The likelihood of seeking professional care is related to a number of factors including, users' perception of the seriousness of symptoms, whether they have any experience of a similar situation and whether they believe that professional assistance will be effective (Whittington et al., 2001). A number of research efforts suggest, however, that a 'natural hierarchy' appears to implicitly exist within users' care seeking strategies. They range from watchful waiting with no action taken at one end of the spectrum, to advice from pharmacy assistants and pharmacists sought somewhere prior to seeking a doctor's advice at the other end.

Community pharmacies have been variously described as a 'first port of call', a 'stepping stone' or 'filter' into seeking professional advice and care in response to illness. Users appear to value the reassurance and 'safety net' of the community pharmacist's opinion, acknowledging that they will be referred to a doctor, if need be (with approximately 6% of cases actually referred on to doctors by community pharmacists) (Hassell et al., 1996; Hassell et al, 1997; Hassell et al., 1998).

Care seeking behaviour among community pharmacy users also differs considerably. For example, observational research highlighted that customer typologies exist among community pharmacy users. Customers were found to fall into one of two types: the 'determined purchaser' and the 'worried well'. Almost a third (29%) of community pharmacy users were described as 'determined purchasers', whereby their interaction with community pharmacy staff took the form of: either demand only for very specific, named, products; or slightly more personalised or inquiring demand (Hassell et al., 1996). These users appeared to purchase medicines in the same way as any other commodity (Rogers, Hassell & Nicolaas, 1999). The 'determined purchasers' contrasted with another customer group, the 'worried well' who typically presented and described

symptoms or problems to pharmacy staff, receiving either reassurance or a product recommendation. This group, however, comprised a very small proportion (5%) of community pharmacy customers overall (Hassell et al., 1996).

1.3.2 Trends in self-care and self-medication

Self-care is frequently regarded as the most obvious and immediate response to maintaining, promoting and restoring health (Fryklof, 1984; Dean, 1989a). Self-care is variously defined. However, a commonly cited definition of self-care is that provided by Lunde (1990) as follows:

"Self-care is what people do for themselves to maintain and cope with illness, which includes health promotion, disease prevention, treatment of minor illness, the management of chronic disease and rehabilitation."

Dean suggests that the bulk of all care in illness may be regarded as self-care (Dean, 1989a). Others concur, variously describing it as an important adjunct to conventional, formal care (Defries et al., 1989) right up to the dominant care response, with professional care regarded as supplemental (Segall, 1989). Indeed, self-care responses are central in three of the four types of illness behaviour described by Dean as follows: (1) decision to do nothing (e.g. watchful waiting as a strategy); (2) non-medication forms of self-care (e.g. home nursing); (3) self-medication strategies; and (4) decision to consult formal care providers (Dean 1989a; Dean, 1989b).

Self-care is a broad and complex concept, incorporating notions of autonomy and influence, relating to consumers' engagement with and informed choice between the matrix of formal and informal health care systems (Dean, 1989; Gross, 1990; Luval et al., 1989). The concept has engendered much debate among sociologists. Polar opposite views on its merits have emerged: ranging from very positive perceptions of it as empowering, promoting consumer sovereignty and choice; to very negative

perceptions of it as overly individualistic, victim blaming, and concerns that it could result in the negation of the broader structural and environmental factors that cause disease (Chapple and Rogers, 1999). Whatever the perspective, it is often described on a continuum of care: ranging from no care at one end; through to self-care managed alone; and ultimately self-care shared with professionals at the other end (Chapple & Rogers, 1999; Bentzen, 1989).

Self-medication is regarded as a form of self-care and may be regarded as referring broadly to the use of non-prescription medicines at three different levels: for health promotion and maintenance or in treatment of self-limiting conditions; or in the early stages of more serious illness; and supplemental care beyond that provided by formal care services in more serious and chronic illness situations (Payne et al., 1996).

Despite the considerable extent of self-care activities, and self-medication strategies within this, self-care and self-medication strategies have, for a long time, been relegated to the periphery of formal health care delivery and their role generally under-acknowledged (RPSGB, 1998). Self-care has, however, been recently 're-discovered'. A number of broader political and policy developments have encouraged this, including: UK health policies encouraging a 'primary care led' NHS; the slow, but steady, deregulation to over-the-counter availability of medicines previously only obtainable on prescription; broader cultural and social developments that have championed increased consumer choice and sovereignty, seeking to empower individuals in health care decision making, to take more responsibility for their health and more actively engage as partners in the national contract for health; alongside the desire of governments to transfer a share of escalating health care costs to consumers (RPSGB, 1998; Fryklof, 1984).

Self-care is now increasingly acknowledged by health policy makers as a 'hidden health care resource' to be tapped into (Fryklof, 1984; Chapple & Rogers, 1999). Consequently, encouraging DIY ('do it yourself') health care is in political vogue

(Reese, 1990). Self-care strategies are increasingly prevalent. This trend seems set to continue. Indeed, Smith asserts that the information age may result in the traditional pyramid of medicine being inverted, with industrial age, professionally led care being increasingly relegated to a more subsidiary support role within a system that increasingly emphasises self-care (Smith, 1997).

Yet, despite their commonness, self-care practices are reported to be relatively under-researched (Haug, Wykle & Namazi, 1989; Segall & Goldstein, 1989). Segall and Goldstein (1989) reviewed research evidence investigating potential correlates with self-care activities in the late 1980s. However, despite the expanding interest in the field, they noted that the literature was "characterised more by debate than data". Their review highlighted the often contradictory and inconclusive findings in the area. Some studies indicated that adoption of self-care strategies were independent of age and sex, while others noted that results relating to these factors were contradictory, allowing no firm conclusions to be drawn. They did, however, outline a few emergent trends that suggested that self-care tendencies appear to increase among the unmarried, better educated, younger, or those sceptical about doctors. Overall, though, they concluded that no one or group of socio-demographic characteristics were systematically correlated with self-care behaviours.

Chapple and Rogers (1999) in a more recent review of qualitative studies investigating what encourages the adoption of self-care strategies identified a number of potentially important explanatory factors, including: sense of autonomy and control; social networks and the influence of others; the timing and stage of the individual's illness; and the meaning of disease to them. Evidence on the effects of self-care efforts in terms of its success and impact on health service utilisation were, however, found to be mixed and inconclusive (Chapple & Rogers, 1999).

Having outlined the incidence of minor ailments and trends in self-care and self-medication practices often adopted to manage them, it is also useful to consider who and

what influences use of general practice and community pharmacy services generally and their use to deal with minor ailments specifically.

Large bodies of research document the influence of a multiplicity of socio-demographic and other characteristics (e.g. cultural values, family and other social network influences) that determine the social situations that may either enable or constrain health related behaviours (Calnan, 1989; Dean, 1989). For example, research investigating why people use primary health care services commonly finds that people who consult most are also most ill (Neal et al., 1998; Campbell and Roland, 1996) and that social disadvantage increases need and consequently utilisation (Campbell and Roland, 1996). Trends in health care utilisation are undoubtedly mediated by multiple contingencies, ranging from psychological to external environment and social factors (Campbell and Roland, 1996, Carr-Hill, Rice and Roland, 1996; Neal et al., 1998; Rogers, Hassell & Nicolass, 1999). Specific trends in the use of general practice and community pharmacy services are outlined below.

1.3.3 Use of general practice services

General practitioners deal with approximately 90% of all episodes of care within the UK NHS (Payne et al., 1996; Bjoke et al., 2002). Approximately one in eighteen symptom episodes are believed to result in consultation with a doctor (Campbell and Roland, 1996). In an average week, the average UK general practitioner will consult with 140 patients (Payne, Ryan-Woolley and Noyce, 1996). 70% of people who consult a general practitioner receive a prescription for a medicine (Yuen, 1999).

Research indicates that around four-fifths (78%) of people registered with a general practitioner consult at least once a year and that the average number of consultations per person per year is five (Tully and Temple, 1999; Hassell, Noyce and Nicolaas, 1998; Hassell et al., 1998). Studies highlight that certain demographic, socio-economic and organisational features of care influence user consultation rates with general

practitioners. These are summarised below. Demographic factors: in general, women consult more than men, twice as often in the 16-44 years age group (Campbell and Roland, 1996). There is little difference in use by marital status, however, the widowed and divorced are more likely to consult a general practitioner than those who are single or married (Roger, Hassell and Nicolass, 1999). Socio-economic factors: users from social classes 4 and 5 consult more frequently for most conditions (Campbell and Roland, 1996). Employment status and type of housing are also strongly associated with utilisation rates. Unemployed people are more likely to consult a general practitioner, especially if they became unemployed within the last year (Hopton, Porter and Howie, 1992; Campbell and Roland, 1996; Carr-Hill, Rice and Roland, 1996). People living in rented accommodation are more likely to consult for a range of conditions than owner-occupiers (Campbell and Roland, 1996; Carr-Hill, Rice and Roland, 1996). Indeed, housing tenure is a stronger independent predictor of consulting behaviour than social class (Campbell and Roland, 1996; Hopton et al., 1992). Consultation rates with general practitioners are also higher for women living with a partner (Carr-Hill, Rice and Roland, 1996).

The organisational feature, distance from services, is also predictive of utilisation rate, with an inverse relationship between distance to facilities and utilisation. Elderly and disabled patients and those with transport difficulties are particularly affected by distance (Campbell and Roland, 1996; Hopton, Porter and Howie, 1992).

1.3.3.1 Minor ailments and use of general practice

Having considered statistics concerning the utilisation of general practice services generally, it is also useful, in the context of this study, to consider the utilisation of general practitioner services by users seeking advice and/or treatment for minor ailments specifically.

The absence of agreement regarding what exactly constitutes, or how one might define, a minor ailment makes measurement of the impact of it on general practice workload hard to disentangle. Literature estimates range widely, suggesting that anywhere between 30 to 70% of general practice workload is taken up dealing with minor ailments (Whittington et al, 2001; Payne, Ryan-Woolley and Noyce, 1996). It has been estimated that between 100 and 150 million general practice consultations a year are taken up dealing with potentially self-treatable conditions (Editorial, 1994; Hoog 1992). Further, it has been suggested that a significant reduction in general practice workload could be achieved (in the order of 16 consultations per general practitioner a day) if users could be encouraged to more actively self-medicate minor ailments (Hoog, 1992). One study indicated that 39% of general practitioner time overall is taken up dealing with minor ailments (Bradley, 1998; NPA, 2002a) and another that over a quarter of general practitioners believe that they spend over 70% of their time consulting about minor ailments (Walker, 1996). These estimates suggest that the resource implications associated with dealing with minor ailments within general practice are likely to be considerable. Cost estimates are rare, although one Audit Commission report estimated that the NHS could potentially save £263M a year by encouraging people to self-medicate minor ailments using non-prescription medicines (Audit Commission, 1996). Such trends may help to explain a British Medical Association discussion paper considering whether general practitioners should continue to prescribe medicines that are available without a prescription, over-the-counter at community pharmacies (Whittington et al., 2001). They also raise the related issue of what the scope of the NHS should be? For example, the place for privately financed care and self-care in the treatment of minor ailments. This is an issue explored further in the Discussion Chapter.

1.3.4 Use of community pharmacy services

There are approximately 12,000 community pharmacists in the UK (Kennedy, 1996; Yeun, 1999; NPA, 2003): 10,460 in England and Wales (NHS Confederation, 2003) and 1150 in Scotland (Scottish Executive, 2003); dispensing 665M and 60M prescriptions per year respectively (NHS Confederation and Scottish Executive 2003). Most community pharmacies open between 31-40 hours a week (NHS Confederation, 2003). The number of community pharmacists in any area is regulated by a licensing system (NHS Confederation, 2003). Community pharmacists, like general practitioners, are independent practitioners contracted by the NHS to provide pharmaceutical services, with NHS dispensing fees accounting for around 80% of a typical community pharmacy's turnover (NHS Confederation, 2003). Approximately 2% of the NHS budget is taken up by community pharmacy (Kennedy, 1996). Remuneration of community pharmacists is funded direct by the Department of Health, is subjected to a negotiated global sum and is, therefore, limited. 12% of total NHS spending (£6,726 in 1999) was expended on general pharmaceutical services, comprising: the cost of medicines; pharmacists' remuneration in the form of dispensing fees; container costs and on-cost allowances (Yuen, 1999; OHE, 2001). UK outlay on pharmacy services is, however, modest by OECD standards (Yuen, 1999).

Six million people visit community pharmacies in the UK every day (600,000 in Scotland); more than to any other health outlet (NHS Confederation, 2003; Scottish Executive 2003; Payne, Ryan-Wooley & Noyce, 1996). A broad range of conditions and symptoms are presented within community pharmacy, with respiratory tract, gastrointestinal tract and skin problems most common (Hassell et al., 1998; Smith and Salkind, 1990; Whittington et al., 2001). Survey research suggests that between 80% and 94% of the UK population report having visited a community pharmacy within the last year (94% in Scotland); approximately 70% within the last month; and that, on average, people make one visit per month to community pharmacies (Tully and Temple 1999; Scottish Executive, 2003; Hassell et al, 1998). Thus, utilisation of community pharmacy is high and, in general, people visit community pharmacies more frequently than general

practices (Hassell et al., 1998). It should be noted, however, that these high utilisation rates are largely due to patients accessing prescription medications via community pharmacies. Estimates suggest that four-fifths of community pharmacy users per month visit for this purpose.

Research indicates that community pharmacy, like general practice, utilisation is associated with particular demographic and socio-economic characteristics. Key trends are summarised as follows: Demographic factors: women are significantly more likely to be users of community pharmacies (with the exception of women over 75 years who are actually three times less likely to visit); whereas men are less frequent visitors, especially if they are in full-time employment. Age is strongly associated with utilisation with the most frequent visitors to community pharmacies aged between 25-44 years and the least frequent between 16-24 years. Those who are either married or co-habiting are more frequent and single or widowed people less frequent visitors to community pharmacies (Tully and Temple 1999; Hassell et al., 1998; Rogers Hassell and Nicolaas, 1999). The chronically ill are also more frequent visitors to community pharmacies. Socio-economic factors: employed people, those within higher socio-economic groups (professionals, managers and non-manual workers) and those who remain in full-time education for longer are more frequent users of community pharmacies compared to those in lower socio-economic groups, with lower incomes, or who left full-time education at a younger age (Tully and Temple, 1999; Hassell et al., 1998; Rogers, Hassell and Nicolaas, 1999).

1.3.4.1 Minor ailments and use of community pharmacy

Utilisation of community pharmacies for health related advice is, in fact, relatively low, with research indicating that only between 5-10% of users actually seek such advice (Hassell et al., 1998; Tully and Temple, 1999). Nonetheless, the average community pharmacy advises approximately 10 clients per day on minor ailments, representing approximately 100,000 minor ailment consultations each day in the UK (Whittington et

al, 2001). In addition, survey data indicates that more than half (57%) of community pharmacy users report purchasing an over-the-counter medicine within the last year (Tully & Temple, 1999). Thus, the community pharmacy represents an important community based, health care resource, widely used to manage minor ailments.

1.3.5 Other factors influencing choices to use general practice and community pharmacy services

Available literature does, however, suggest that there are a multiplicity of factors (alongside the demographic and socio-economic characteristics of the individuals users themselves) that potentially influence decisions regarding if and when to use general practice or community pharmacy services. Key factors relevant to users' choices to visit community pharmacies are summarised below. (Related advantages and disadvantages associated with users' choices to visit general practices can be deduced from their opposites).

There are a number of recurrent advantages identified by users associated with using community pharmacies. Convenience factors are amongst the most commonly cited benefits. The open access nature of community pharmacy, the immediacy of advice with no need to make an appointment or wait, alongside the proximity to users' home or work (usually within walking distance) facilitates easy, quick access (Hassell et al., 1997; Hassell et al., 1998; Varnish, Jesson and Wilson, 1998; Rogers, Hassell and Nicolaas, 1999; Whittington et al., 2001).

The possibility of a proxy consultation on behalf of another person is another commonly identified advantage of using community pharmacies, with over a quarter (27-30%) of all consultations of this nature (Hassell et al., 1996; Hassell et al., 1997; Hassell et al., 1998; Rogers, Hassell and Nicolaas, 1999; Whittington et al., 2001).

Drawing on previous experience and the ability to care for oneself is another important advantage identified by users. This is particularly the case for conditions about which

users have received advice on management through informal, lay networks, or which they have successfully self-managed and/or treated before. In addition, many people welcome the opportunity to manage conditions they consider to be trivial or minor, often citing alleviating pressure on doctors and the NHS as a result (Hassell et al., 1996; Hassell et al., 1998; Rogers, Hassell and Nicolaas, 1999; Whittington et al., 1999).

Finally, specific features of community pharmacy service are also seen as advantageous. The pharmacist's specialist knowledge of medicines is appreciated, as is the fact that many users perceive that pharmacists have more time to consult with and advise them than doctors. This is especially valued if the user has a negative perception of his/her doctor e.g. finding them to be unsympathetic. Friendliness and approachability of community pharmacy staff is also frequently reported as advantageous, with users comfortable with relationships developed with pharmacy staff over time, and expressing loyalty to particular outlets as a consequence (74% in one large survey) (Hassell et al., 1996; Hassell et al., 1998; Tully and Temple, 1999)

A number of disadvantages associated with using community pharmacies are also identified in the literature. Lay beliefs concerning professional boundaries are important, with many users noting that it is not the role, or indeed that it is inappropriate, for pharmacists to diagnose (Hassell et al., 1998). Related to this, the inability of community pharmacists to consult users' medical records is perceived to be problematic (Hassell et al., 1998)

Disadvantages regarding the organisation of community pharmacies are also identified, particularly privacy concerns, often relating to the lack of dedicated consulting areas, alongside availability of the pharmacist to provide advice (Whittington et al., 2001; Hassell et al., 1998).

The affordability and willingness of users to buy medicines from community pharmacies, is also frequently raised as potentially problematic, especially for lower

income groups who qualify for free prescriptions on the NHS. Faced with a choice between either paying for a medicine at the community pharmacy or receiving it free on prescription, it is suggested that many users have no choice but to visit a doctor (Rogers, Hassell and Nicolaas, 1999; Whittington et al, 2001).

Finally, there are also a number of perceived disadvantages to accessing medicines from community pharmacies in that some users are cynical about the efficacy of non-prescription medicines, with many believing that medicines from the doctor are 'stronger', alongside user concerns over inappropriate and/or over-utilisation of medicines, often related to concerns over developing 'immunity' to medicines (Hassell et al., 1998).

Survey evidence investigating user attitudes to choice between consulting either general practitioners or community pharmacists in response to a minor illness seems, however, to contradict their actual behaviour. A number of studies suggest that when people do seek care, generally they prefer to consult a doctor rather than any other health professional (Jepson et al., 1991; Whittington et al., 2001; Caldow et al., 2000). Yet, other research indicates people frequently identify the pharmacist as a good source of advice (Hassell et al., 1998); eighty-six percent in one large survey, with two-thirds noting that they believe that pharmacists should be consulted more frequently to avoid consulting a doctor (PAGB, 1998). Interestingly though, the same survey highlighted that user views were not borne out in their actions, with over half reporting that they obtained most of their health advice from a doctor. Indeed, evidence suggests that people are ten times more likely to consult with a doctor or dentist to deal with a minor ailment than a pharmacist, whose advice was only sought in 1% of cases (PAGB, 1998).

1.3.6 Trends in the use of medicines

Medicines are often central in self-care efforts. Their increasing availability has enhanced user opportunities to substitute between both care professionals (e.g. general practitioners and community pharmacists) and types of medicines (prescription and non-prescription) in the management of minor ailments. Thus, it is useful to consider general trends in the use of medicines within the UK.

1.3.6.1 Classes of medicines available in the UK

Three classes of medicine exist within the UK under the Medicines Act 1968, namely: general sale list medicines (GSL); pharmacy medicines (P); and prescription-only medicines (POM).

General Sale List medicine (GSL)

General sale list medicines are licensed products which can be sold or supplied direct to the general public in an unopened manufacturer's pack from any lockable business premise (RPSGB, 2003c; Whittington et al, 2001a).

Pharmacy medicines (P)

Pharmacy medicines are products, licensed as GSL medicines, but restricted to sale through pharmacies (RPSGB, 2003c). They are any medicinal products other than those designated as GSL or POM products (Whittington et al., 2001a). They need not be sold under the supervision of a pharmacist, however, the premises must be under the personal control of a pharmacist (RPSGB, 2003c). Written point of sale protocols must be in place to direct the safe sale of P medicines (Payne, Ryan-Woolley & Noyce, 1996). Control is exerted over aspects of these medicines, including: maximum dose and maximum daily dose, dosage form, period of treatment, quantity and maximum strength (Delatraz-Delporte & Stanford, 1998).

Prescription-Only Medicines (POM)

Prescription-only medicines are those medicinal products described as such in the Prescription-Only Medicines (Human Use) Order (RPSGB, 2003c). They may only be sold or supplied against the signed prescription of an appropriate practitioner i.e. doctors, dentists and certain nurses (Whittington et al., 2001a).

Over-The-Counter medicines (OTC)

Over-the-counter medicines comprise medicines legally classified as either P (Pharmacy) or GSL (General Sales List).

1.3.6.2 Use of prescription medicines

There are 1500 prescribable preparations in the UK; 10% of which are frequently prescribed (OHE, 2001). These are categorised into 16 broad therapeutic groups, relating to either a bodily function or aspect of care. In 1985, a 'Selected List' was introduced (and revised in 1993) identifying items either included or excluded from NHS prescribing. Excluded items are typically products for which cheaper generic substitutes are available, or those considered not medicines. These products excluded from the NHS have become known as the 'Black List' (Scottish Pharmaceutical General Council, 1998). These products do, however, remain available via a private prescription (OHE, 2001).

In 2000, total cost of NHS prescribing was £6726 M (£560M in Scotland) consuming 12% of total NHS expenditure and representing an annual per capita spend of approximately £113 (with an average net ingredient cost of around £90 per capita, per annum and an average cost per prescription of £8.98) (Yuen, 1999; OHE, 2001). General practitioner prescribing accounted for 10% of the UK NHS budget with 75% of this spent on repeat prescribing (Bond et al., 2000).

93% of prescriptions written are dispensed (OHE, 2001). Approximately half of the UK population are entitled to free prescription medicines (OHE, 2001). 85% of dispensed prescriptions are exempt from prescription charges (of these 55% are exempt on the grounds of old age; 15% because of low income; 10% to children and young people; and 10% to those who have a prepayment certificate) (Eversley and Sheppard, 1998; OHE, 2001; Rogers, Hassell and Nicolaas, 1999). 15% of prescriptions are charged for (Walley, 1998). About 60% of prescriptions cost less than the charge (Walley, 1998; Griffin, 1996). For every chargeable prescription item dispensed, patients contribute approximately 6% of the cost (this figure has fluctuated between 5-10% during the 1980s and 1990s) (OHE, 2001; Eversley and Sheppard, 1998). In the 1990s, NHS dispensing grew by an average of 3.6% per annum (Yuen, 1999) and spending on pharmaceutical costs and chemists remuneration by 63% in real terms (OHE, 2001). That said, UK prescribing costs and pharmaceutical expenditure remain moderate compared to other developed countries (OHE, 2001). Nonetheless, pharmaceutical costs represent a sizeable and growing share of NHS expenditure, which is not subject to a cash limit. Consequently, health policy makers have been keen to stem the seemingly inexorable increases in this area of NHS expenditure, implementing a number of measures to manage and contain costs wherever possible.

1.3.6.3 Use of non-prescription medicines

Reliable figures on the utilisation of non-prescription medicines in the UK are relatively scarce and dated. Sales of non-prescribed, over-the-counter medicines (P & GSL classes) were, in 1994, estimated to be approximately one third of the NHS drugs bill and used to treat one in four symptoms (Blenkinsopp and Bradley, 1996; Payne, Ryan-Woolley & Noyce, 1996).

In 1972, Dunnell and Cartwright undertook a landmark study, across a stratified sample of British households (N=686), investigating self-medication practices of adults (N=1412). They reported that wide ranges of prescription and non-prescription

medicines were routinely kept in British households, with over-the-counter medicines outnumbering prescription ones. They found that the average number of medicines kept per household to be 10.3; 7.3 over-the-counter and 3 prescription medicines (Dunnell and Cartwright, 1972). Over a decade later, the Proprietary Association of Great Britain commissioned a UK wide survey investigating adults' (N=1217) use of over-the-counter medicines over a 12-month period. This study identified that over-the-counter medicines were used in one out of four adult ailments (PAGB, 1987). In a Canadian study of medicine use among a random sample of Winnipeg adults (N=524) respondents reported high levels of effectiveness of over-the-counter medicines (94%) with almost two-thirds (63%) reporting having used an over-the-counter medicine within the previous two weeks (Segall, 1990). All three of these studies reported that respondents typically saw themselves as healthy and able to discriminate effectively between conditions that they could self-treat and those that required medical advice and/or a consultation (Dunnell and Cartwright, 1972; PAGB, 1987; Segall, 1990).

Common findings across other studies indicate that non-prescription medicines are used more often by women than men and more frequently by the better educated, although this may be confounded by associations with higher income (PPRRC, 1996). Evidence from the RAND Health Insurance Experiment also indicated that better educated and more knowledgeable consumers used more over-the-counter drugs and, further, that such consumers spent higher proportions of their drug expenditure on over-the-counter products (Leibowitz, 1989).

More recent research gives further indications of utilisation patters for non-prescription medicines. In 1996, Payne et al., conducted a postal survey (N=679) investigating factors influencing consumers' decision making processes and willingness to pay for over-the-counter medicines. They identified that the variables most likely to correctly predict the purchase of over-the-counter medicines were: a stated preference for an over-the-counter purchase; prior knowledge of over-the-counter availability; if the user was liable to pay prescription charges; and if they were not taking any prescription

medicines. In addition, they identified a number of other significant predictor variables that were associated with increased likelihood of buying over-the-counter medicines, including: users within younger age groups (<60 years); less frequent attenders at general practice (4 or less in the last year); and among users expressing no loyalty to a particular pharmacy. In contrast, they found that: users exempt from prescription charges; on regular prescription medications; over 60 years old; or on low incomes were significantly more likely to obtain deregulated products via an NHS prescription route (Payne, Ryan-Wooley & Noyce, 1996).

A diary study (N=549 people within 215 households) investigating household medicine usage over a month, found that 52% of people took at least one over-the-counter medicine per day (Hassel et al., 1998). Another more recent survey of a population of pharmacy users (representative of the UK population) found that, among the high proportion of adults who reported having used a community pharmacy in the last year (80-94%), over half (57%) reported buying an over-the-counter medicine in that period (Tully and Temple, 1999). Purchasers of over-the-counter medicines were found in this study to be more likely to have a car, to be married or co-habiting, have left full-time education at over 14 years and to be in professional or non-manual occupations (Tully and Temple, 1999).

Use of over-the-counter medicine by those also in receipt of prescription medicines is also estimated to be very common, at between 71-85% (Carlisle and Green, 1994).

1.3.7 The broader policy context

It is useful to contextualise trends in minor ailments and user responses to them within broader health policy initiatives that influenced these developments generally and the promotion of substitution between general practice and community pharmacy in the management of minor ailments specifically. Related, and often simultaneous, policy developments are thus considered. First, a chronology of efforts to 're-badge' community pharmacy is presented. The profession's efforts to re-emphasise their expertise in medicines, as well as their broader skill base; championing their suitability to adopt an extended role within primary care service provision, and successive governments' policy initiatives to embrace this, are outlined. Next, simultaneous policy initiatives facilitating the deregulation of medicines, thus increasing the availability of P class medicines, is detailed. Then, concurrent metamorphoses in general policy direction, regarding government concerns to manage demand within primary care, are outlined; highlighting the shift from concerns to contain demand, to facilitating more graduated access, while optimising skill-mix. Efforts to effect skill-mix substitutions between primary care professionals generally and between general practitioners and community pharmacists in the management of minor ailments specifically are outlined. Finally, the evidence on the effectiveness of these initiatives is reviewed and critically examined.

1.3.7.1 Extending the role of community pharmacy within primary care

A detailed chronology of events associated with proposals to extend the role of community pharmacists within the primary care sector is outlined in table A1.2 in Appendix 1 and briefly summarised below.

Community pharmacy was, for many years, not seen as an integral part of the NHS. Rather, community pharmacies were viewed predominantly as sources of medicines, rather than advice. First official recognition of the under-utilisation of the pharmacy profession came in a 1979 Royal Commission on the NHS (Merrison, 1979). This represented the first in a long succession of reports, spanning the last 25 years, authored by both the profession and governments, recommending extension of community pharmacists' role. Health policy makers recognised that genuine improvements in primary care services could be realised if the expertise of community pharmacists was more fully utilised. They appreciated not only the unique position that community pharmacy occupied at the interface between lay and professional care but also their accessibility and skills and recognised that these advantages could be harnessed without requiring large scale structural change and, perhaps even more importantly, cost. Consequently, health policy strategies of successive governments sought to capitalise on the benefits associated with making better use of community pharmacy and thus supported efforts by the profession to extend their role.

Initial policy documents, while supporting an extended role for community pharmacists, seemed to focus primarily on the profession's potential to assist in cost containment efforts. In particular, policy makers were keen to secure community pharmacy's assistance in managing the increasing NHS drugs bill; enlisting their support to secure improvements in the management and use of medicines and in reducing medicines waste. Curtailment of drug expenditure was perhaps an easier political strategy to adopt to contain costs, with its effects less visible than many others (Grund, 1996). Only in the late 1980s, when policy initiatives began to envision an NHS 'led by primary care,' did

more serious effort and attention begin to be devoted to integrating community pharmacy into the NHS mainstream. In this period, community pharmacists were increasingly recognised to be essential contributors to multidisciplinary primary health care teams; with identified responsibilities including more active engagement in, the management of medicines, chronic conditions, minor ailments and health promoting activities.

From the mid to late 1990s to date, policy initiatives have progressed further still, outlining that community pharmacists' extended contribution need not be constrained to extending access to services specifically but also to provide broader support of user self-care efforts and facilitate more active user engagement in health care decision making generally. Alongside enhanced therapeutic roles, community pharmacy involvement is now acknowledged to be instrumental in improving both the quality and range of primary care services available, with new contractual and remuneration systems currently being devised to incentivise these developments and encourage more active engagement in the planning and delivery of innovative services with partner organisations (Bond, 2003). The challenge for policy makers is to design incentive mechanisms reorienting pharmaceutical services towards more safe and effective therapy instead of just safe and effective drugs (Huttin, 1996).

1.3.7.2 Medicines deregulation

Around the same time that it was being acknowledged that pharmacists were being under-utilised in the UK, efforts began to deregulate or reclassify certain medicines.

There are many rationales underpinning medicine deregulation, including: lowering health care costs; making better use of pharmacists' training and knowledge; encouraging increased self-care efforts; improving user access and convenience; and increasing sales of pharmaceuticals (Andersson & Hatziandreu, 1992). Deregulation of medicines was enthusiastically embraced in the UK because it complemented broader

policy goals. Cost containment concerns seemed, however, to be the dominant imperative underpinning medicine deregulation. There was a widely held belief that deregulation, by increasing the availability of medicines, would encourage self-medication for minor ailments. It was assumed that this would help to contain NHS costs as users substituted purchases of pharmacy available (P) medicines in place of prescription medicines (POMs) obtained during consultations with general practitioners; simultaneously securing savings on the NHS drugs bill and promoting more efficient use of scarce primary care resources.

A drug may be considered for deregulation, from prescription only (POM) to pharmacy available (P) status, if: it is used to treat minor ailments; if patients can understand the drug, appreciating its effect or otherwise; and be familiar with the condition for which it is used. Drug safety is, however the main consideration concerning potential deregulations (Andersson & Hatziandreu, 1992).

A small number of medicines were reclassified in the UK during the 1980s. In 1992, however, a European Commission directive sought to standardise both the availability and classification of medicines across member states. This directive required regular review of medicines classification, stipulating that the prescription only (POM) classification be retained only where absolutely necessary. This resulted in the UK Medicines Control Agency revising their procedures to expedite medicine deregulations, where appropriate. Thus, from 1992 onwards, many more medicines were 'depommed' i.e. reclassified, or switched, from prescription only (POM) to pharmacy available (P) over-the-counter at the chemist (Hassell et al., 1996; Hassell et al, 1998; Bond, 2001). These developments were significant amid the broader, ongoing professional and governmental efforts to make better use of community pharmacists.

Increased availability of P medicines made self-medication of minor ailments, and the associated substitution between general practice and community pharmacists, increasingly possible. This engendered vigorous debate within the literature and a

multiplicity of potential advantages and disadvantages related to deregulation and the increasing availability of medicines were pondered. Unfortunately, space will not permit their enumeration here. They are, however, outlined in table A1.3 in Appendix 1.

1.3.7.3 Demand management policies in primary care - graduating access and optimising skill mix

Rapidly increasing health care costs is a common trend across western industrialised nations. The combination of ever-increasing demand for health services in the face of finite resources has resulted in an inevitable, and politically uncomfortable, disconnect between the demand and supply sides of the health care sector. This has forced all western, industrialised nations to devise cost containment measures. In many countries, the UK included, primary care professionals have been strategically placed at the vanguard of efforts to manage demand and contain costs, by virtue of the first-contact and gate-keeping responsibilities traditionally associated with their roles. The two demand 'problems' commonly identified are, increasing volume, compounded by inefficient responses to meet it. This results in the worst possible situation of inefficient utilisation of scarce resources.

Labour costs are typically the most expensive resource input to health care production processes, typically consuming around 80% of total expenditure (Office of Health Economics, 2001). Basic economic theory posits that technical efficiency is attained when output is maximised from available resources (Begg, Fischer & Dornbusch, 1991). Thus, in considering cost containment and enhanced, graduated access strategies within the UK NHS, it is no surprise that health policy makers have turned their attentions to skill mix considerations. The concept of skill mix aims to match clinical presentation to an intervention based on skills and training (Kernick, Reinhold & Mitchell, 1999). Ensuring that appropriate skill mix combinations are deployed in the provision of quality health services has become a key health policy priority.

In the UK, academic and policy literature has, for many years, suggested that general practitioners' skills are being used inefficiently, dealing with trivial conditions that could be delegated to other, less skilled and less costly, care professionals (Whittington et al., 2001; Payne, Ryan-Woolley and Noyce, 1996; Editorial, 1994; Hoog 1992; Bradley, 1998; NPA, 2002; Walker, 1996; Audit Commission, 1996). In recent years, however, academic and policy debates have shifted perceptibly, moving away from narrow demand management goals, simply aiming to deter consultations, to broader concerns to effect more expeditious, appropriate and graduated access to primary care services. Central also to these policy efforts have been the objectives to develop a more responsive immediate care system that enhances patient access, choice and convenience. This has been evidenced by developments like NHS walk-in centres and NHS Direct. Maximising response to need, in efficient, appropriate and acceptable ways, to as many people as possible, in a timely fashion, within available resource, is the new end game. Increasing demand for under utilised, cost effective services is, for example, an acceptable strategy in this more enlightened approach (Rogers, Entwistle & Pencheon, 1998; Gillam & Pencheon, 1998).

Skill mix substitutions within UK primary care

A number of initiatives have been introduced within the UK primary care sector in recent years, involving the realignment of professional skill mix in efforts to support more graduated access to improved immediate care services that simultaneously ensure that the right patients are seen in the right place at the right time while enhancing user access and convenience. Both lay-professional and inter-professional skill mix have been experimented with. Specific service developments introduced within the primary care sector to try to realise these policy ambitions include: walk-in centres; expansion of out-of-hours and minor injuries services; the introduction of nurse-led telephone consultation services such as NHS Direct and NHS 24; general practitioner telephone consultations; virtual consultation services and referral of people with self-limiting conditions direct to community pharmacies. (Rogers, Hasell & Nicolaas, 1999; Rogers, Entwistle & Pencheon, 1998; Gillam & Pencheon, 1998; Whittington et al., 2001).

These service developments have been backed up by the introduction of targets within primary care to ensure that patients are seen either within 48 hours by a general practitioner or other health care professional within 24 hours (Department of Health, 2000).

1.3.7.4 Evidence on UK primary care skill mix substitutions generally

Evidence on the success of these skill-mix substitutions within primary care, in terms of clinical, health service utilisation and cost outcomes, is however mixed.

Lay-professional skill mix substitutions

For example, randomised controlled trials investigating the impact of lay-professional substitutions, encouraged through the distribution of information booklets aiming to promote self-care in the management of minor ailments, found either no (Heaney et al., 2001) or a very modest impact (Little et al., 2001) on subsequent utilisation of health services.

Practice nurse-general practitioner substitutions

However, three randomised controlled trials investigating the substitution of nurses in place of general practitioners to manage minor ailments in general practice settings generally yielded positive findings. Practice nurses' patients were significantly more satisfied with their consultations; nurses did not write significantly more prescriptions than doctors; although nurse consultations were, typically, significantly longer (between 2-5 minutes per consultation) compared to general practitioners (Schum et al., 2000; Kinnersley et al., 2000; Venning et al., 2000). Two of these trials found that there was no difference in symptom resolution or health status outcomes between groups, but did identify differences (increases) in referrals or re-attendance rates (Kinnersley et al., 2000; Venning et al., 2000).

The national evaluation of the nurse-led telephone consultation service provided by NHS Direct, investigated the impact on demand for immediate care services following its introduction. It concluded that while it had not reduced demand for out-of-hours general practice care, it appeared to have restrained its increase (Munro et al., 2000). The national evaluation of primary care walk-in-centres, led by nurses, demonstrated encouraging patient satisfaction and safety results; although again nurse consultations were found to be considerably longer (Salisbury et al., 2002a; Salisbury et al., 2002b; Salisbury et al., 2003c; Grant et al., 2002).

Only one of the trials investigating nurse management of minor ailments in general practice examined cost effectiveness and identified no difference between groups (Venning et al., 2000). Yet, another study investigating substitution of nurses in place of general practitioners to conduct telephone consultations within general practice out-of-hours type settings demonstrated cost effective use of resources (Lattimer et al., 2000).

Evidence from the literature leads one to conclude that substitution of nurse practitioners in place of general practitioners is generally effective. Further, research investigating user views on wider nursing roles (undertaken in Scotland) found that doctor-nurse substitution appeared to be broadly acceptable. It indicated that while people's first preference is generally to consult a doctor, they would consult with a nurse if confident in their abilities and as long as they could still consult a doctor if they felt they needed to (Caldow et al., 2000). These results are encouraging as research investigating doctor-nurse skill mix generally, suggests that between 30% to 70% of all tasks performed by doctors could be carried out satisfactorily by nurses (Richarson & Maynard, 1995). Clearly this could have profound implications for medical manpower, health professionals' roles and costs.

Community pharmacist-general practitioner substitutions generally

Community pharmacists, like other primary health care professionals, have come under close scrutiny by health policy makers concerned to ensure that their expertise is optimally deployed within primary health care teams.

The pharmacy profession's desire to extend its role complemented successive governments' cost containment, demand management and graduated access policy agendas. An opportunity to 'kill two birds with one stone' presented itself; simultaneously meeting the ambitions of both the pharmacy profession and policy makers. Policy makers believe community pharmacists to be perfectly positioned to mediate demand for primary health care services and reinforce patients' own self-care behaviours (Rogers, Hassell & Nicolaas, 1999). Consequently, they have been keen to include community pharmacy more fully within the primary care loop, maximising their skills and encouraging the development of their role from reactive, paternalistic dispensers and controllers of medicines into proactive advisers and collaborators with both patients and other care professionals (Kennedy et al., 1996).

Extension of community pharmacists' roles have resulted in various skill mix substitutions being tested within UK primary care to see if community pharmacists can improve patient journeys through care systems, facilitating closer integration between professionals and improving patient access to and benefit from medicines. These substitutions have been mainly with general practitioners and have included involvement in: repeat prescribing schemes; medication reviews; health promotion interventions; management of common and minor ailments; and various other initiatives.

A multiplicity of studies exists investigating the success of community pharmacists' extended professional role within the UK. Examples of successful community pharmacy involvement in new roles were identified in the course of the literature review e.g. good therapeutic control achieved by a pharmacist led primary care anticoagulant clinic (MacGregor et al., 1996) and successful pharmacy management of medication review

and repeat prescribing systems within general practice (Jones, Matheson & Bond, 2000; Bond, et al., 2000).

A Cochrane collaboration review investigating the impact of outpatient pharmacists' roles on health services utilisation, costs and patient outcomes was also identified (Bero et al., 1997). It included 14 studies, involving 1991 patients over the period 1973-1996. The review concluded that pharmacists can successfully substitute for doctors in drug management and that the delivery of services by pharmacists decreases use and/or costs of health services and improves patient outcomes relative to no comparable service. Based on these findings, Bero et al., (1994) recommended that pharmacists should continue to provide patient counselling concerning drug therapy and also to continue to educate physicians on this matter. However, a number of qualifications were flagged in the Bero review. These concerned the generalisability of the studies; the poorly defined nature of the interventions being studied and the general absence of either patient outcome or cost data. These are important qualifications in terms of potential UK policy learning, particularly as the studies were almost exclusively American, raising several doubts regarding whether this evidence, rooted within a health care system characterised by a fundamentally different philosophy and incentive systems is useful in the UK. Further, UK based research is urgently required to redress this evidence deficiency regarding the impact of extended roles for pharmacists.

1.3.7.5 Evidence on substitutions between prescription and pharmacy available medicines and general practitioners and community pharmacists in the management of minor illness specifically

Another key area within UK primary care where community pharmacist-general practitioner substitution has been promoted is in the management of minor ailments. Suggestions that community pharmacists could become more actively involved in this area can be traced back to the initial landmark reports that proposed extending community pharmacists' roles (Merrison, 1979; RPSGB, 1986). Health policy documents embraced these suggestions, albeit only implicitly at first. Perceptions that high levels of minor, self-limiting conditions are being inappropriately managed within the formal primary care sector have, however, resulted in more explicit policy support recently for community pharmacist-general practitioner substitution in this area. Indeed, this particular skill mix substitution now represents a key plank in policy initiatives aiming to foster more graduated access to primary care (Hassell et al., 1998; Whittington et al., 2001).

Policy interest in this particular community pharmacist-general practitioner substitution opportunity has been intense. This is due to the double substitution opportunity it presents - from more (general practitioners) to less (community pharmacists) skilled and costly care professionals and from public (via NHS prescription medicines) to private (over-the-counter) payment for medicines - thereby alleviating pressure on NHS resources by transferring an increasing share of direct health care costs over to consumers. The widely held assumption within both the professional and policy literature is that promotion of self-medication for minor ailments will help contain NHS costs, as users substitute the purchase of pharmacy available (P) medicines in place of prescription (POM) medicines obtained during general practitioner consultations, thus securing savings on the NHS drugs bill and promoting more efficient usage of scarce general practitioner time.

At the genesis of this policy idea, however, specific supporting evidence did not exist. Even to date, there is a relative paucity of evidence on the consequences of deregulation on the demand for prescription and over-the-counter medicines and the extent to which they may be regarded as substitutes in either the medical or economics literature. There has been no overall cost benefit analysis of policies to encourage use of the community pharmacists as a substitute for general practitioners in the management of minor ailments using over-the-counter medicines.

There are, however, a number of related research efforts that offer clues regarding the potential impact that deregulation of medicines facilitating substitution between care professionals may have, including: consumer surplus analyses and medical gain approaches, modelling the benefits associated with the deregulation of particular medicines; retrospective utilisation reviews of prescription and non-prescription medicines; and prospective reviews examining use of and demand for certain types of medicines and related services. These more general research efforts are relevant for considering the likely success of these policy initiatives, in terms of the extent of substitution actually achieved and the associated economic implications, and are summarised below.

Consumer surplus analyses and medical gain approaches

Early research studies investigating the economic implications of the reclassification of prescription to pharmacy available medicines, conducted not long after deregulation efforts began in the USA and UK, indicated that substantial savings to both users and the health sector could potentially be realised.

Temin (1983) was first to investigate the net benefits associated with medicine deregulation, applying consumers' surplus and medical gain methods (with the choice of method dependent on the drug examined and availability of relevant data). He applied consumers' surplus analysis to estimate the net benefits associated with deregulating topical hydrocortisone in the USA. In applying this method he made a number of

assumptions concerning: the demand curve for the drug, the change in its full price due to deregulation and the rate at which consumers would respond; which he then combined with estimates on the number of individuals currently using the drug on prescription, the number of individuals who would switch to buying the drug over-the-counter after deregulation, and number of individuals who were not using the drug who would begin using it when it was available over-the-counter. Based on these assumptions, Temin estimated the benefits associated with the deregulation of topical hydrocortisone in the USA to be in the order of $433M in 1981.

Next, Temin used the medical gain method to estimate the benefits associated with the hypothetical deregulation of penicillin within the USA. He noted that this method is more suitable for conditions that are more difficult to value from the patient's point of view as it can be used to value the expected outcomes of deregulation without reference to the demand curve. The medical gain approach utilises epidemiological, population level data (as opposed to individual consumer level data) such as prevalence of the disease, treatment patterns, productivity changes and changes in rates of medical care utilisation, and relates them to expected increases in the use of the drug attributable to the switch. Using this method Temin estimated the benefits associated with deregulation of penicillin in the USA to be in excess of $1B, in 1981.

Oster et al., (1990) also applied consumers' surplus analysis in a hypothetical deregulation modelling exercise of two histamine H2-receptor antagonists in the USA, concluding that the switch was a relatively safe means of self-care for acid-peptic disorders that could substantially reduce the patient use of health care services, and consequently costs, related to minor gastrointestinal complaints.

Finally, Ryan and Yule undertook the only application of consumers' surplus analysis to investigating the impact of medicine deregulation in the UK. They applied the method to estimate the net benefits associated with the UK deregulation of loperamide and topical hydrocortisone, calculating them to be £4.2M and £2.0M respectively (in 1987

prices) (Ryan & Yule, 1988; Ryan & Yule, 1990). This is a well-conducted and methodologically rigorous study. However, the study suffers from a number of limitations, some inherent to the consumers' surplus analysis method; and others due to their specific application of the method.

Ryan and Yule adopted a number of simplifying assumptions (as did all of the studies identified from the literature that applied consumers' surplus analysis to investigate drug deregulation) which if altered might have changed their findings. These limitations are outlined below.

The modelling design adopted meant that the results were not based on actual, revealed preference data, which would have been better. Perhaps more importantly, the study assumed direct, successful and complete substitution between the two methods of accessing the medicines. It assumed that everyone who previously accessed the medicine from the general practitioner on prescription would switch to buying it over-the-counter from community pharmacies. Yet, if a user is exempt from paying the prescription fee, it is unlikely to cost them less to buy the medicine direct over-the-counter and thus they might not switch their consultation route, thus violating their complete substitution assumption.

In addition, the P medicines Ryan and Yule consider were among the first to be deregulated and ones for which there were very obvious symptoms (e.g. diarrhoea and skin irritations). Consumer awareness about them was reasonably good. Hence, they were obvious candidates for deregulation. However, fifteen years on, a large number of medicines have been deregulated for use across a broad range of conditions. Thus, symptom recognition and user decisions or confidence to self-medicate and switch consultation routes to access these other medicines may be less clear-cut.

Further, the study did not consider whether, after purchasing a medicine over-the-counter, users made subsequent follow-up visits to care professionals. Thus, the study

implicitly assumed that user's substitution efforts were successful; i.e. that their condition was successfully resolved without requiring further professional advice or treatment. This may not always have been the case. It is very likely that some users would have required a follow-up consultation with either a general practitioner or community pharmacists, to obtain further advice and/or treatment. This is important as such complementary utilisation of services would reduce the estimated resource savings.

A number of crucial costing assumptions were also made that influence the results of the Ryan and Yule study. They assumed that all users faced the same costs, meaning that if one user found it beneficial to switch they all would. For example, they assumed that all users were currently paying the prescription charge. Clearly, this is unlikely to be the case. They did, however, acknowledge this as a limitation, noting that only if cost to users of obtaining the medicine over-the-counter was less than the cost to them of obtaining it on prescription would they in fact switch (Ryan & Yule, 1990).

Important assumptions were also made regarding the cost of the drugs concerned. For example, they assumed that the drugs concerned were being subsidised by the government, with the prescription charge paid by users less than the true cost to the government of providing it. Similarly, they assumed that the over-the-counter price was less than the prescription fee. For the two drugs concerned, these were, in fact, appropriate assumptions. However, these assumptions do not necessarily hold for other P class medicines available on prescription. In many cases, the prescription charge is more than the true cost to the government of providing it and/or the over-the-counter price of comparable P medicines are often more expensive than the prescription fee. Building in these alternate cost scenarios may make the benefits of switching less apparent.

In applying the consumers' surplus analysis method, Ryan and Yule did not address key theoretical assumptions that must be met to ensure robustness and appropriate interpretation of their findings. In particular, there is no consideration of the

distributional issues implicit within their findings to highlight that within the overall (macro level) benefit identified, there are likely to be winners and losers. Identifying to whom these might occur is crucial in appraising the impact of medicine deregulation and self-medication policy. Considering the distributional considerations in moving from individual consumer's surplus to groups of consumers' surplus is the essence of the policy debate and my research question.

Finally, the consumers' surplus analysis method is in itself somewhat limited, in that it focuses mainly on the net benefits to consumers. It is, therefore, only a partial analysis. It does not clearly elucidate the associated changing distribution of costs and benefits impacting in the health sector as a result of changing consumer behaviour. Ultimately, decisions to visit either the general practitioner or community pharmacist to access a medicine depend on the individual's own cost-benefit calculus and trade-offs. Rarely do individuals consider how their decisions may affect others. However, individual versus aggregate effects are key. Policy makers and analysts should address interpersonal comparisons, even if individuals do not. Broader economic evaluation techniques are required to investigate these issues more thoroughly, particularly as one of the key drivers of deregulation of medicines and self-medication was a desire to encourage more appropriate utilisation and relieve pressure on primary care resources within the NHS.

Overall, the Ryan and Yule study presented an important first step in investigating the potential benefits to consumers and society associated with increasing availability of medicines deregulated from POM to P status. However, it also raised numerous issues that require further investigation and research.

The study presented in this thesis aimed to address many of these issues and extend the Ryan and Yule research in several key ways:

- by adopting a prospective design investigating actual usage or revealed preferences in P medicines' usage;
- building in follow-up of users to assess the extent of actual substitution and/or complementary usage between the general practitioner and community pharmacist in use of P medicines;
- including all P medicines available, both existing or recently deregulated, which varied both in price relative to the prescription fee (with some costing more and some costing less to obtain over-the-counter) and whether they were being subsidised by the government or not;
- applying both average and actual user cost data to derive benefit estimates (e.g. accounting for prescription exemption or not);
- considering a broader range of potentially relevant costs and benefits;
- elucidating methodological issues with respect to the application of consumers' surplus analysis and the implication for interpreting and generalising the results;
- and extending the analysis, applying broader economic evaluation techniques to investigate costs and benefits and the changing distribution to all the key parties involved (users, general practitioners, community pharmacists, the health sector/government and society overall).

Overall, these early studies, applying consumer surplus analysis, suggested that potentially significant benefits could be realised through medicine deregulations that made substitutions between accessing a medicine on prescription from a doctor to buying it over-the-counter from a community pharmacist possible. However, although largely methodologically sound, their findings do need to be interpreted with a degree of caution. They were based largely on modelling exercises, attempting to predict (by comparing prescribing levels before and after deregulation) changes in demand and user consulting behaviour associated with the deregulation of medicines. Further, they were

premised on a number of uncertain assumptions, the most important of which was that direct and perfect substitution would occur, an assumption for which there was little actual evidence.

Retrospective and prospective utilisation reviews of prescription and over-the-counter medicines

Evidence that utilisation of both prescription and over-the-counter drugs are price sensitive is, however, well established (Leibowitz, Manning & Newhouse, 1985; Birch, 1986; O'Brien, 1989; Ryan & Birch, 1991; Huttin, 1994; Hughes & McGuire, 1995; Gerdtham & Johannesson, 1996; Lundberg et al., 1998; Eversley & Sheppard, 1998; Joyce, Escarce & Solomon, 2002). Research results consistently find that price elasticity (defined as the percentage decrease in demand divided by the percentage increase in price) is negative (i.e. as price increases, quantity demanded decreases) and inelastic (i.e. quantity demanded falls proportionately less than the price increase). These negative price elasticities are generally in the range –0.1 to –0.6 (-0.1 to –0.3 in the UK); that is a 10% increase in price gives rise to a reduction in demand of between 1-6% (Ryan & Birch, 1991; Gerdtham & Johannesson, 1996). Changes in the prices consumers are required to pay, clearly affect demand for both prescription and over-the-counter drugs. Whatever the scheme (fixed fee, co-insurance or prepayment), increases in charges lead to decreases in consumption (Huttin, 1994).

Investigating the policy assumption that prescription and over-the-counter drugs are substitutes is, however, slightly more complex. Standard microeconomic theory posits that demand for a good is inversely related to its own price (i.e. as its price increases, quantity demanded decreases and vice versa) and positively related to the (cross) prices of its substitutes (i.e. as the price of a good increases, demand for its substitutes increase and vice versa). To test whether two goods are substitutes, it is usual to regress the price of one on the quantity demanded of the other (i.e. to investigate the impact on the demand for the substitute goods as their relative prices change). A positive regression co-efficient indicates that the two goods are substitutes – that is – individuals shift from

one (e.g. obtaining a P class medicine on prescription from a general practitioner) to the other (e.g. buying a P medicines direct, over-the-counter, under the supervised sale of a pharmacist) in response to changes in relative costliness (Stuart & Grana, 1995).

Specific evidence regarding the extent of substitution or complementary usage between prescription and over-the-counter drugs is scarce, contradictory and inconclusive (Blaxter & Britten, 1996). For example, O'Brien (1989) investigated NHS prescription drug utilisation, identifying positive cross-price elasticities of demand (+0.22) between over-the-counter products and prescriptions that indicated that substitutions occur among individuals eligible to pay for their prescriptions (i.e. that a 10% increase in prescription charges results in demand for substitute, over-the-counter drugs increasing by 2.2%). However, the existence of such substitution was less clear among users exempt from prescription charges. Stuart and Grana (1995) also identified economic substitution between prescription and over-the-counter drugs among an elderly sample in the USA, which was associated with level of insurance coverage and among individuals with 'less serious' conditions.

In contrast, however, Leibowittz (1989) found no evidence of substitutions between prescription and over-the-counter drugs within the RAND Health Insurance Experiment. On the contrary, use of over-the-counter and prescription drugs was correlated, indicating their use as an adjunct, as opposed to as a substitute, for formal medical care. People with complete insurance coverage purchased more of both types of drugs. The policy expectation that people assigned less generous insurance for prescription drugs would substitute over-the-counter drugs in place of prescription drugs obtained from physicians, was not supported by the data.

Other studies concur, reinforcing the suggestion of complementary usage of over-the-counter and prescription drugs, often finding that those who consult the most, also use over-the-counter medicines the most (Blaxter & Britten, 1996; Carlisle & Greene, 1994). Blaxter and Britten (1996) in an article reviewing the lay use of medicines literature,

also note the contradictory evidence base from qualitative studies investigating substitution, citing numerous studies which suggest that substitution behaviour, where it exists, differs depending on the types of symptoms experienced, the drugs concerned and the age of users.

There are other problems with the available evidence base concerning the existence and extent of substitution between prescription and pharmacy available drugs and the economic implications of this. Much of the research is now quite dated; it is based on either very few drugs or particular groups of users; and many of the studies are American, the results of which may not be generalisable to the UK, given the very different health care systems and incentive structures that operate in the two countries. In addition, the economic analyses undertaken to date have tended to focus on a particular perspective (for example, the net benefits to consumers or the savings for the health sector) rather than investigating the changing distribution of costs and benefits across all relevant stakeholders and the overall welfare implications.

However, the key failings of the studies undertaken to date, are that they are based mainly on retrospective investigations into changes in aggregate prescription data, pre and post deregulation. This approach has failed to investigate the complex choice processes and the associated costs and benefits accruing from users' *actual*, revealed consumption behaviour. Even in studies where substitution between prescriptions and over-the-counter medicines was found to exist, they failed to identify the mechanics of it and, in particular, whether it was doctor- or patient-initiated. This is crucial to determine the extent to which substitution or complementary usage of prescription and over-the-counter medicines exists and in accurately estimating the economic consequences of changes to prescription and over-the-counter medicines.

Recent UK evidence

Two recent research efforts have partially improved upon this situation, as they investigated users' actual consumption choices and the extent of substitution achieved in the use of prescription and over-the-counter medicines in the management of minor ailments within the UK. It should be noted, however, that these studies differ to the current study in that they investigated the impact on demand for general practice services of paying community pharmacists fees to provide access to and advice on the use of certain medicines (used in the treatment of a specified range of minor ailments) free to eligible groups.

The first, the 'Care at the Chemist Scheme' (Whittington et al., 2001a; Whittington et al., 2001b; Hassell et al., 2001; Bojke et al., 2002) comprised a before and after study investigating community pharmacist substitution for general practitioners in the management of 12 minor ailments. The study ran for 26 weeks within one general practice located in Merseyside, with 93% of prescription items dispensed exempt from charges. The study intervention enabled users exempt from paying prescription charges to visit community pharmacies and access medicines free (from a pre-agreed formulary); thus removing the financial incentive for these users to visit their general practitioner (given that this is typically the only way to access free medicines)

Patients requesting either an urgent, same day appointment or a prescription (by visit or telephone) for one of the 12 minor ailments included within the study were offered the opportunity to visit one of eight local community pharmacies instead of the general practice. Participating community pharmacists were paid £1.50 per patient, to offer advice and/or a medicine concerning the minor ailment episode. Crucially, medicines were provided free at the community pharmacist to users exempt from paying prescription charges. This was key as research suggests that individuals weigh-up the cost and benefits of seeking pharmacy or medical care and that, despite the time costs associated with consulting general practitioners to obtain prescriptions, many patients exempt from prescription charges, although able to self-treat, are unwilling to do so, due

to the out-of-pocket expenses they would incur buying medicines over-the-counter at community pharmacies (Hassell, Noyce & Rogers, 1999; Schafheutle, Cantrill & Nicolson & Noyce, 1996; Hassell et al., 1998; Payne, Ryan-Woolley & Noyce, 1998).

Key findings of this study indicated that: a 38% uptake rate (576/1522) was achieved, with over a third of the total workload for 12 minor ailment conditions referred to community pharmacists; overall general practitioner workload was not reduced, however, the proportion of total GP workload comprised of minor ailments fell by about a quarter, from 8.9% to 6.6%; there were no significant differences in patient characteristics between users electing to consult general practitioners compared to community pharmacists; users were no more likely to re-consult if they opted to visit a community pharmacist - 6% of users opting to visit the community pharmacy re-consulted (2.4% with general practitioners and 3.3% with community pharmacists) compared to a 4% re-consulting among general practitioner visitors. User views were generally positive, identifying time saved to both doctors and users and accessibility and convenience factors as the key benefits. Statistical analyses to predict the patient's choice between consulting either the community pharmacist or general practitioner found that the choice was highly dependent upon the type of minor ailment e.g. patients presenting with thrush or lice were much more likely to choose to consult a community pharmacist, whereas patients with coughs, earaches and sore throats were more likely to choose to consult a general practitioner (Bjoke et al., 2002).

Economic analysis of the implications of the 'Care at the Chemist Scheme' was minimal. However, crude costs for community pharmacy consultations were estimated to be between £1.44 and £1.85 (with an average consultation length of 3.4 minutes); compared to between £2.91 and £6.87 per general practitioner consultation (with an average consultation length of 4.2 minutes). Overall, prescription costs did not increase, although the number of items prescribed did increase. These findings led the authors to suggest that the community pharmacy option would be cheaper.

Overall, the study team concluded that the 'Care at the Chemist Scheme': demonstrated equivalent user satisfaction; improved patient access; reduced general practice minor ailment workload; encouraged more appropriate use of professionals' skills; with no significant increases in drug costs; and patients no more likely to re-consult, having visited a community pharmacist, rather than a general practitioner (Whittington et al., 2001a; Whittington et al., 2001b; Hassell et al., 2001; Bjoke et al., 2002).

The 'Direct Supply of Medicines' pilot in Scotland (April 2001- March 2002) is the other recent and important research contribution in this area. It investigated the impact of directly supplying medicines (from a limited formulary) to users from community pharmacists, across a defined range of conditions, again with medicines supplied free to users exempt from prescription charges (Schafheutle et al., 2003; Sheehy & Jones, 2003). In this pilot, patients exempt from prescription charges were invited to register with local participating community pharmacists, who were paid on the basis of volume of registrations. The main findings of the scheme indicated that uptake of the scheme was low in both areas, with only 4% and 23% of eligible users registering across the two study areas (these figures subsequently rose to 5.6% and 26.9% in an extension period of the pilot). None of the participating community pharmacists reached the upper limit of the remuneration band of 750 registrations. Around half of the users who registered actually used the scheme. Younger age groups were much more likely to use the scheme. The pilot had only a small effect on the minor ailments workload in general practice, which fell by only 1.5% and 2.6% in the pilot year. Head lice, pain and cough were the most frequently presented conditions. Participating community pharmacists consulted with between 21 to 205 users and were generally positive about the scheme and reported noticing little perceptible impact on their overall workload. Users also reported favourable opinions of the scheme, with enhanced convenience identified as particularly beneficial. Average cost per consultation was estimated to be in the range £1.49 to £2.40 (£2.07 to £2.87 in the pilot extension) (Schafheutle et al., 2003; Sheehy & Jones, 2003).

These two studies represent an important addition to the evidence base regarding community pharmacist-general practitioner substitution in the management of minor ailments. Their key contribution is that they investigate the practicalities of the substitution, the impact on general practice minor ailment workload and the acceptability to users. Overall, they appear to demonstrate that the burden of providing advice and treatment for minor ailments can be successfully transferred from general practitioners to community pharmacists. Their main weaknesses relate to their: inadequate consideration of economic implications; inclusion of either a limited number of conditions or only certain users; limited collection of personal level data; and concerns over generalisability of their findings given their low uptake rates and very specific settings. By comparison, the study reported in this research conducted extensive economic analyses; included all patients and all P medicines; collected patient level data; and reported on usual practice. Overall, though, the studies are complementary.

Largely in response to the Care at the Chemist and Direct Supply of Medicines pilot schemes, there are now more than 20 similar schemes in operation throughout the UK (Blenkinsopp, 2003; RPSGB, 2003a). The schemes operate in a variety of different ways, for example: some are for specific groups, whereas others are for everyone; referrals onto the scheme can come via practice receptionists, nurses, general practitioners, community pharmacists or the patients themselves; written protocols and/or formularies of medicines are agreed, with patient group directions, if needed; and a variety of methods employed to remunerate community pharmacists including, consultation or capitation fees, price of medicines, or a one-off annual fee (Blenkinsopp, 2003; RPSGB 2003a; RPSGB, 2003c).

1.3.8 Gaps in the evidence base

The literature review outlined above demonstrates that there are general bodies of literature and research, across a number of disciplines, generally relevant for considering the impact of increasing availability of P class medicines and the extent to which this facilitates substitution between general practitioners and community pharmacists in the management of minor ailments within primary care. Research efforts investigating these issues specifically are, however, rare.

For example, while a burgeoning literature exists on the use of medicines generally, there is little on the use of P medicines, or medicines recently deregulated to P status, specifically. Research investigating use of medicines typically dichotomises medicines into either prescription or non-prescription categories only. Rarely, despite the policy pertinence, does it differentiate between the general sales list (GSL) and pharmacy available (P) classifications, thus making it difficult to tease out the more detailed nuances in changing trends in medicines use and their potential implications. Likewise, while good survey evidence exists that helps us to understand use of general practice and community pharmacy services, it tends not to shed much light on increasing P medicines utilisation in these contexts and consequent impacts for the structure and provision of primary care services and the economic implications associated with this. This is perhaps unsurprising as these utilisation data have been collected for other purposes e.g. to inform the National Morbidity and General Health surveys.

As a result, despite current extensive use of both prescription and non-prescription, over-the-counter drugs, we still do not have a clear picture of the kinds of people who use them; the factors influencing users' consultation patterns; the extent of substitution or complementary usage between POM and P drugs; the welfare implications associated with the changing distributions of costs and benefits accruing as a result of changes to POM and P medicines; and their impact upon changing structures of primary care.

The available evidence suggests that there is no simple relationship between availability of over-the-counter medicines and demand for NHS prescriptions. The assumption that pharmacy available (P) drugs directly and only substitute for consultations with general practitioners and prescription (POM) drugs in the management of minor ailments is overly simplistic. The interface between self-medication and the NHS is likely to be more complex (Thomas & Noyce, 1996). Complementary usage of some P drugs and GP consultations undoubtedly exists. Thus, potential savings arising from reductions in GP consultations may be less than assumed. Unfortunately, however, few P or over-the-counter medicines have been evaluated in formal clinical trials in the settings in which they are used and there has been no overall cost benefit analysis of policies to encourage use of P medicines accessed from community pharmacists as a substitute for prescription medicines obtained from general practitioners in the management of minor ailments, that enable us to either challenge or confirm these assumptions (Bjoke et al., 2002).

Thus key gaps exist in the current evidence base that must be redressed. It is not enough to simply accept that, because substitution between general practitioners and community pharmacists appears intuitively obvious, it should be promoted; tempting as it may be given that it coincides with prevailing policy and professional aspirations. In an increasingly evidence-based world, it is incumbent upon policy analysts to explore the details and investigate the implications to all concerned.

Support for research efforts investigating these issues comes from a number of influential quarters. For example, in 1994, Mays produced a detailed critique of health services research in pharmacy, within which he specifically identified: the need for further research investigating patients' careers in medicines use; and the need for economic analyses of the issues associated with deregulation, investigating its effects on levels of use and costs to both the NHS and patients (Mays, 1994). This review was well received and endorsed by both academic and professional organisations (RPSGB, 1998 a & b).

Further, the Medical Research Council, in its 'Primary Care Topic Review', specifically prioritised the need for research efforts to enhance understanding of: health seeking behaviours within primary care; factors influencing demand, as opposed to need, for primary care services, investigating appropriate efforts to modify demand; as well as approaches to the assessment and management of undifferentiated and minor illness within primary care and the outcomes of alternate ways of dealing with these (MRC, 1997). The study outlined in this thesis sought to address several of these identified priorities which undoubtedly contributed to its success in attracting an 'MRC Special Training Fellowship in Health Services Research' to fund the research.

The research presented in this thesis seeks to plug some of these gaps in current knowledge, by undertaking detailed description and analysis of users' consultation patterns in accessing P medicines drugs, assessing the extent of actual substitution between general practice and community pharmacy in their use, and analysing changes in the distribution of costs and benefits across key stakeholders as a result. This information is urgently required to allow users, general practitioners, community pharmacists, health commissioners and health policy makers to make more informed choices about the appropriate provision of skills and medicines to manage minor ailments within primary care. Thus, the research outlined in this thesis is timely and highly relevant and is summarised in the aim and objectives specified next.

Aim

The overall aim of this research project was to:

Assess the extent to which increasing availability of P class medicines has resulted in substitution or complementary usage between general practice and community pharmacy services; investigating the range of direct and indirect costs and consequences accruing to users, general practitioners and community pharmacists as a result.

Objectives

Within this aim there were five distinct objectives including:

- Profiling the sample of users accessing P medicines, identifying patterns of P medicine use among different socio-demographic and socio-economic groups;
- Mapping the routes adopted by users to access P class medicines;
- Assessing the extent of substitution or complementary usage between general practice and community pharmacy services as a result;
- Developing a model aiming to predict users' choice of access; and
- Investigating the welfare implications, at both the micro (individual user and professional) and macro (health policy) levels, of the changing distribution of costs associated with policies encouraging increased self-medication using P medicines.

Chapter 2:

Methods

2.1 Introduction

The aim of this chapter is to outline the methods applied within the research presented in this thesis. It begins by stating the philosophical underpinnings of the research. Issues related to the choice of study design adopted and sample selection procedures are then outlined. Next, the development, piloting and conduct of the data collection are summarised. Finally, the data analyses methods are described.

2.2 Philosophical underpinnings of the research

It is important for all researchers to consider the ways in which different research methods produce data, their ontological, epistemological and methodological underpinnings and what these mean for their interpretation.

Social science research has, for many years, been characterised by the existence of a paradigmatic dichotomy between qualitative and quantitative research endeavours (Mays & Pope, 1995). They adhere to very different views about the construction of knowledge (Milburn et al., 1995; Brannen, 1992). Differential belief in single versus multiple truths or realities is at the crux of the epistemological debates (Milburn et al., 1995; Milburn et al., 1994).

On balance, however, the paradigms are not as polarised as they might at first seem. They are perhaps more productively viewed as existing on a continuum, ranging from positive, scientific, quantitative approaches at one end, to constructive, interpretive, qualitative approaches at the other (Coast, 1999; Steckler et al., 1992). At the most basic levels, they are similar in that they are both based on observations, data are central to both approaches and both can generate theories inductively and test them deductively.

The ontological, epistemological and methodological philosophies underpinning economics and health economics are predominantly positivist (Coast, 1999). Two main branches of economic theory are drawn upon in this research – demand and welfare economics. Demand theory may be classed within the realms of positive economics in which there is believed to be a discoverable (single) reality, or objective 'truth', about which laws can be uncovered by research. Methodological individualism prevails (Begg, Fischer & Dornbusch, 1991). Research proceeds through processes of falsification via the development and testing of hypotheses, with theory derived mainly deductively, from standard axioms and assumptions (Coast, 1999).

Welfare economics, on the other hand, is regarded as normative. It differs from positive economics in that it is explicitly recognised as being value judgemental. Indeed, its primary purpose may be regarded as offering prescriptions or recommendations the aim of which is to inform how policy should proceed (Begg, Fischer & Dornbusch, 1991; Coast, 1999). In welfare economics the concern is to maximize welfare through the satisfaction of preferences (Coast, 1999). Preference elicitation and investigation of the nature and content of utility functions among key stakeholders in the health sector comprise a large body of the theory and research in this area of economics (Coast, 1999).

The methodologies (and specific methods) of demand theory (consumers' surplus analysis) and economic evaluation (cost-minimisation analysis) are firmly rooted within rationalist, positivist epistemology. So too are the data generation (questionnaire survey) and analyses (descriptive and analytical statistics) techniques applied. As such, the philosophy of science adopted in this research may be regarded as predominantly rooted within the positivist tradition.

This approach was adopted as it was believed to offer a logical and practical first step in exploring the key research questions outlined. In addition, it more readily

complemented the disciplinary perspective, and experience of the researcher. It was not, however, intended to indicate that the researcher believed this to be a superior, or indeed the only, approach to investigating the study questions. On the contrary, the researcher ascribes to a 'realist' world view, believing that behaviours have a reality for individuals, that reasonably stable relationships can be identified and that from these patterns it is possible to derive constructs that can be helpful in explaining individual action (Miles & Huberman, 1994; Coast, 1999; Pawson & Tilley, 1998; Abercrombie, Hill and Turner, 1988). Explanation, according to realists, is concerned with providing an account of the structures, mechanisms, powers and tendencies that together produce the phenomenon of interest (Coast, 1999; Pawson & Tilley, 1998). A strength of the realist ontological perspective is that it embraces methodological pluralism (Pawson & Tilley, 1998). Given the complex and contingent nature of consumer decisions regarding use of medicines, the researcher believes that appropriate combinations of both quantitative and qualitative, are likely to enhance our understanding. The potential for mixing methods to build upon the current research in the future is an area that will be returned in the discussion section of the thesis.

2.3 Selecting a study design

A descriptive study design was believed to be most appropriate to investigate the research aim and objectives of interest in this study (Hennekens & Buring, 1987; Beaglehole, Bonita & Kjellstrom, 1994). This study investigates user response to recent policy initiatives encouraging increased self-medication in the management of minor illness using P class medicines. Previous research efforts have investigated issues relating to use of general practice and community pharmacy services by patients in the management of minor illness episodes. However, these have tended to focus on use of these services in isolation, viewing them almost as if they were mutually exclusive options. To the researcher's knowledge, no other empirical studies have investigated the choices users make in accessing P medicines. The outcome being studied (i.e. choice to access P medicines from either the general practitioner or community pharmacist) is

relatively new and the important covariates are not known and associations with the outcome not well understood. The general approach of this study is, therefore exploratory and descriptive.

The research study outlined aims to explore potential covariates and consider them in relation to existing theory, highlighting areas for future research. Thus, this research has a predominantly pragmatic purpose and represents the beginning of efforts to appraise the success or otherwise of current policy initiatives and potentially inform future policy development in this area.

A primary research design was elected for the study. The researcher was unaware of other research efforts investigating potential substitutions or complementary usage between general practitioner and community pharmacist services in the use of P medicines. Secondary data sources that could be used to investigate or describe this did not exist. In addition, a key objective of the study was to consider the costs associated with accessing P medicines to use in the treatment of minor illnesses, from a number of perspectives – general practitioners, community pharmacists and users. Limited amounts of secondary data sources were available to estimate costs accruing to general practitioners e.g. national unit costs estimates (Netten, Dennett & Knight, 1998) and there was one source of estimates for certain elements of community pharmacist time taken up in related efforts (Savage, 1995). These were fairly crude, limited and the appropriateness of their use within the context of the current study unknown. However, there were no secondary data estimates or sources available regarding the resource and time costs accruing to users of these services. Given that this was a key objective of the study this was problematic. Thus, primary data collection was inevitable. Although time consuming and expensive, it was, nonetheless, advantageous, enabling investigation of the research questions in the context of a real population of users, capturing actual, revealed preference data of users accessing P medicines, facilitating detailed and reliable estimates of costs accruing to the stakeholders within the study setting.

2.4 Study design and setting

A cross-sectional descriptive study, with prospective follow-up of a sub-sample of users was undertaken. Key advantages associated with cross-sectional studies are that they are: useful for planning health care and resource allocation; valuable for describing patterns; helpful in formulating hypotheses; and are generally cheaper and quicker to perform. Prospective follow-up enabled data collection to be focused on answering the specific research questions at hand and reliably capture utilisation and cost data as it occurred, helping to minimise potential biases, particularly recall bias. The study was based within the Lothian Health area in Scotland, UK.

Short interviews were conducted with users in pharmacies, at the point of purchase or dispensing of P medicines. Follow-up telephone interviews were then conducted with all willing users. Telephone follow-up was selected as it was felt to be less intrusive to users and thus likely to generate better response rates, as well as being less time consuming and more practical. The telephone interviews aimed to track users' subsequent use (if any) of general practice or community pharmacy services, thus collecting complete information on consultation routes adopted by users, within the context of a specific illness episode. Deciding upon the optimal follow-up period was tricky. Consideration of the minor nature of the conditions presented, alongside practical concerns to minimise potential recall difficulties, resulted in a two to four week follow-up period being adopted.

2.5 Sample selection(s)

2.5.1 Community pharmacies

The aim was to recruit a sample of community pharmacies into the study, covering as broad an area of Lothian region as possible, in an effort to embrace a representative population of users. Advice on the sample selection process was sought from the

Lothian Health Pharmacy Facilitator, a local Consultant in Public Health and the Information Co-ordinator for Lothian Health. In line with their recommendations, community pharmacies were purposively sampled with key inclusion criteria as follows: (a) community pharmacies spread across the whole geography of the Lothian Health catchment population, including pharmacies in city centre, town, suburban and rural areas; (b) community pharmacies reflecting the range of deprivation categories present within Lothian Health (established after socio-demographic profiling); (c) a mixture of both independent and chain pharmacies; and (d) both busier and quieter pharmacies. By engaging in purposive sampling of this nature, the intention was to recruit a sample broadly representative of the community pharmacies within the Lothian Health area more generally.

Seventeen community pharmacies were identified according to the above inclusion criteria. The main pharmacist was provided with a project information pack and invited to participate (Appendix 2). General practices local to these pharmacies were informed of the study via the Local Area Medial Committee (Appendix 2).

Two of the study community pharmacies were located in East Lothian, six in West Lothian, two in Midlothian and five within the Edinburgh City area of Lothian.

2.5.2 Medicines

The study included all P class medicines simultaneously available from general practitioners on prescription or over-the-counter direct from community pharmacists. A P class medicine is defined as: "a medicinal product which is not a prescription-only medicine and which is either: (a) not a medicinal product on a general sale list, or (b) a product referred to in Regulation 8 of the Medicines (Sale or Supply) (Miscellaneous Provisions) Regulations 1980" (RPSGB, 2004). Essentially a P medicine is any medicinal product, other than those classified as GSL or POM products (Whittington et

al., 2001; RPSGB, Lyndon Braddick, Director for the Scottish Department, Personal Communmication, 2004). Pharmacy medicines can be sold or supplied from a registered pharmacy by, or under the supervision, of a pharmacist, subject to certain exceptions (Whittington et al., 2001). These P class medicines may be usefully distinguished in two ways: either those that have been routinely available in the P class for some time; or those recently deregulated from a prescription-only-medicine to pharmacy available (i.e. POM to P switched medicines). It is important to note, however, that both are available in mainly one of two ways: either from a general practitioner on prescription, or from a community pharmacist in a supervised, over-the-counter sale.

Initially, it had been planned to review prescriptions and till receipts for all P medicines dispensed or sold during fieldwork days. This would have facilitated assessment of the representativeness of the community pharmacies' P medicines activity captured within the study. However, the participating pharmacists were not in favour of making such information available to the researcher due to its 'commercially sensitive' nature and the time commitment involved in such an undertaking.

2.5.3 Users

The general population using community pharmacies to access 'P' class medicines within the Lothian Health Board area was the study target population. It was anticipated, however, that the results of the study were likely to be relevant further afield. Evidence from the literature indicated that direct recruitment of community pharmacy users at the point of sale was feasible, having been successfully tried elsewhere (Bramstad et al., 1994; Bond et al., 1996; Hassell et al., 1996). The study population was recruited by asking all users obtaining P class medicines, either on prescription or over-the-counter, to participate. They were identified at the point of sale or dispensing within community pharmacies, advised of the study and invited to take part. Users who agreed to participate were given a leaflet outlining the study in more detail (Appendix 2).

Recruitment was planned to continue until a total sample size of 1500 users had been achieved. Feasibility studies recorded dispensing and sales volumes of P class medicines. The results indicated that recruitment of 1500 users would be feasible, recruiting within six community pharmacies for five to seven days. However, early pilot work suggested these recruitment figures were overly ambitious. More conservative volume estimates indicated that fifteen community pharmacies would need to be involved, for a period of 10 days each, if the target 1500 users were to be recruited.

Given the complex nature of the study, precise power calculations regarding the optimal sample size were not possible. However, on the advice of a medical statistician it was anticipated that the a sample size of over 1000 users would have sufficient power to detect important differences between groups and to estimate population parameters with good precision. The developmental nature of the proposed data collection methods meant that it was also difficult to estimate sample attrition rates (for example from loss to follow-up). Thus, this was reviewed in early pilot work to ensure that reasonable follow-up could be achieved within the sample. Adequate sample follow-up (63% at 2 to 6 weeks) was attained in pilot work.

The purposive sampling methods outlined aimed to ensure that the sample was broadly representative of the overall socio-demographic profile of the Lothian Health area. In the absence of a random sample, selection biases could potentially arise (Greene, 2000; Heckman, 1990; Vella, 1998). Consequently, a number of measures were built into the study design in a bid to minimise potential sample selection bias and assist in assessing the representativeness of the study sample.

Data were collected across a ten day period within each pharmacy, covering at least one full week's business, across all opening times, including late nights and weekends. In this way, all users of the community pharmacies had an equal chance of being included within the sample. In addition, a 'non-responder minimum data collection form' was designed to establish if non-responders were in any way systematically different from

responders. Further, in order to assess the overall representativeness of the study sample, it was compared to the overall demography of the Lothian health area and to the individual catchment population areas within which each of the sample community pharmacies were located. This was done using Lothian Health socio-demographic profile data sources, including the Director of Public Health's annual report, as well as other available comparative data sources (Lothian Health, 1996a). In particular, the study sample was compared with the broader Lothian Health population according to age, gender, deprivation category and population by postcode and 'depcat' breakdowns. Finally, the study sample's characteristics were compared to other national data sources, including for example, Census data and 'Scottish Health Survey' data (Scottish Office, 1997a). To aid this process, standard socio-economic questions, general health and use of service questions used within larger national surveys were included in the study questionnaires to indicate how the study sample compared to other populations in terms of response and key respondent characteristics (Scottish Office, 1997a; ONS 1998a; ONS 1998b; ONS, 1998c; ONS, 1998c; National Centre for Social Research, 1999). Overall, these measures aimed to enable a judgement to be made about the representativeness of the study population in relation to both the Lothian Health area and national survey data and to assess the extent of potential selection biases present.

2.6 Development of data collection instruments

Three main data collection instruments were developed: a short pharmacy questionnaire interview; a non-responders' minimum data collection form; and a telephone follow-up questionnaire interview. These instruments aimed to: elicit users' routes to access P class medicines; establish whether the users revisited the general practitioner or community pharmacist concerning the illness episode for which they had obtained the P medicine; map the logistics of their visit; and enumerate key time and resource costs incurred by users and primary care providers. Guidance on the design and piloting of

the research instruments was carefully adhered to (Streiner & Norman, 1995; Moser & Kalton, 1973; Moser & Kalton, 1993; Oppenheim, 1993).

2.6.1 Community pharmacy questionnaire interview

The aim of this instrument was to describe the route adopted by users to access deregulated 'P' class medicines and to ascertain the associated costs accruing to users and other stakeholders as a result (Appendix 2).

The questionnaire interview (taking approximately 5 minutes to complete) was administered by a researcher within community pharmacies, with consenting users, immediately after the sale or dispensing of a P class medicine and covered socio-demographic details of the user including, date of birth, marital status, employment status, postcode, educational background and ethnic group. It should be noted, however, that the data on users' socio-economic status was indirect. Collection of more direct socio-economic data e.g. on incomes was not possible as participating pharmacists objected to this. The researcher was mindful of the ecological nature of the deprivation status variable, derived from users' postcodes (acknowledging that being resident in a deprived area does not equate to being poor) and thus exercised caution in its interpretation.

The pharmacy questionnaire also collected details on: the route adopted by the user to access the P medicine; the user's exemption status for prescription drugs and the retail price of the P medicine, if obtained over-the-counter. Further, depending upon whether the user consulted their general practitioner, a community pharmacist, or both, data was also collected on: their method and distance of travel to the general practice/community pharmacy and any time and financial costs accruing to users while attending consultations (including, for example, waiting and consultation times and necessity to take time off work or to arrange child care).

At the end of the pharmacy interview, the researcher sought the user's permission to be prospectively followed-up (by telephone) to answer a few questions regarding their subsequent use (if any) of general practice and community pharmacy services. In addition, respondents were asked two open questions to ascertain their views regarding use of community pharmacies. Survey respondents were given the opportunity to remain anonymous, unless they agreed to be followed-up. In this case the user's name and a contact telephone number was collected.

2.6.2 Non-responders' minimum data collection form

This instrument aimed to collect a minimum amount of data about those users refusing to participate in the study (Appendix 2). It collected information on pharmacy name; interviewer name; day, date and time of refusal; gender; prescription or over-the-counter sale; and any reason(s) given for the non-response. It was intended that this instrument would enable the researcher to assess the existence and extent of any systematic differences occurring in the sample between responders and non-responders that could lead to bias.

2.6.3 Telephone follow-up questionnaire interview

The aim of this instrument was to follow-up participants in the short pharmacy questionnaire interview (who gave consent) to ascertain their subsequent use (if any) of general practice and community pharmacy services (Appendix 2). They were conducted with users a minimum two weeks and maximum of 4 weeks after participation in the initial pharmacy interview. The follow-up period was decided upon in line with guidance within the literature regarding appropriate follow-up and recall periods and consideration of the minor nature of the conditions presented (UK Working Party on Patients' Costs, 1999).

The telephone follow-up interview established if any follow-up consultations occurred regarding the same illness episode that the P medicine was obtained for and elicited information on the key time and resource costs accruing to key stakeholders associated.

By combining the information collected in both the pharmacy and telephone follow-up interviews, it was possible to establish a complete history for the illness episode concerned, for which the P medicine(s) were obtained. This also facilitated assessment of the extent of substitution or complementary usage between general practice and community pharmacy services within the sample, and the costs to users of accessing P medicines via different routes.

2.7 Pilot work and refinement of data collection instruments

A pilot study was undertaken to assess the suitability and adequacy of the three data collection instruments. It was conducted in three different community pharmacies (including both chain and independent pharmacies) across a range of areas (residential and shopping) within a variety of deprivation categories (affluent, mid-affluent and deprived). The pilot was conducted in different community pharmacies from the fifteen participating in the main study. 50 pharmacy and 20 telephone follow-up interviews were piloted and re-piloted on four separate occasions.

2.7.1 Pilot of the community pharmacy questionnaire interview

Overall, the general administration of the short pharmacy questionnaire went well, taking a maximum of five minutes to complete; generating encouraging telephone follow-up rates; causing minimal disruption to the pharmacy business; and yielding the desired data on routes to access P medicines and the associated costs to users.

As expected, however, a number of minor teething problems arose including: some questions with apparently ambiguous language; inadequacy of the questionnaire to deal with proxy responders; a tendency for responders to discuss 'personal' medical problems due to the open nature of some of the questions; screening out of some potential respondents (e.g. with learning disabilities) by pharmacy staff; and lower than expected numbers presenting to the pharmacies for P medicines.

A number of modifications were thus undertaken to improve the process of data collection using the pharmacy questionnaire instrument. A project information pack was developed to distribute to participating pharmacists and their assistants to ensure maximum recruitment of all eligible respondents. This pack included: a brief summary of the aims of the project; clear details on inclusion criteria; a standard introduction and invitation to the project; and counter display materials (posters and leaflets) for pharmacy staff and users to refer to.

A number of general modifications were also made to the questionnaire, including: use of more user friendly 'lay' language; improvements to the wording of the ambiguous questions; ensuring consistent use of language and terms throughout all sections of the questionnaires; and improving the prompts and 'go to' instructions to improve the flow of the questionnaire interview. In addition, the questionnaire was adapted to build in sensitivity for 'proxy' responders, to avoid losing these interviews and data. Further, the number of closed, pre-coded response questions was increased and the layout of the questionnaire simplified to facilitate ease, speed and consistency of completion across researchers and to facilitate data entry and management.

Adjustments were made to de-sensitise questions eliciting socio-demographic and other personal information from users, by incorporating use of only 'yes' or 'no' answers, developing show cards to anonymise responses and by asking such questions near the end of the interview. Also, to facilitate comparison of the study sample with other local and national data sets, standard socio-demographic questions were incorporated from national surveys (Scottish Health Survey, 1995; ONS 1998a-d).

2.7.2 Pilot of the non-responder minimum data collection form

The non-responder minimum data collection forms worked well during the fifty pilot interview stages, requiring no major changes. Non-responders were easily identified and the form very quick and easy to complete.

2.7.3 Pilot of the telephone follow-up questionnaire interview

The telephone follow-up questionnaire was piloted with users over a range of time intervals following their initial pharmacy interview from two to six weeks. Respondents identified quickly with the study and were happy to participate in the telephone follow-up interview. Depending on whether the users had re-visited their general practitioner or community pharmacist, or not, the telephone follow-up interview lasted between two to five minutes. No problems emerged with this instrument, probably because most of the questions within it mirrored those undertaken during the short pharmacy interview, which was subjected to fairly extensive piloting.

2.8 Training and monitoring of support research staff

Increasing the number of participating community pharmacies from six to fifteen, to achieve the target sample size, necessitated recruitment of three temporary support research staff to assist with the pharmacy interviews. They each covered three community pharmacies, with the lead researcher undertaking the data collection in the remaining six.

A training day for the temporary research staff was developed and organised by the lead researcher to ensure that they were fully cognisant of the study's aims, familiar with the use of the pharmacy questionnaire, and consistent in its completion. To this end, a 'briefing pack' was prepared and circulated to the support researchers to read prior to their training day, including: a summary of the projects aims; project summary leaflets; user information leaflets; an alphabetical list of all P medicines; fieldwork instructions; specimen study introductions to users; general notes on coding and completion of the pharmacy questionnaires; luminous pharmacy counter display posters; the pharmacy questionnaire and accompanying show cards; non responder minimum data collection forms; fieldwork timetables; project contact details; and University of Edinburgh identification badges and cards for use during fieldwork (Appendix 2).

In addition, the temporary researchers shadowed the lead researcher for three days each during the first two weeks of the fieldwork, receiving 'on the job' training and resolving any queries or difficulties they may have had, prior to them going into the field independently. In this way, it was hoped to ensure data quality and consistency in the administration of the questionnaire. The lead researcher also monitored the support researchers' progress on an ongoing basis to identify and/or avert problems as they arose. Extra training or assistance was provided where felt to be necessary. This was undertaken in one case to iron out minor problems with incomplete questionnaires.

2.9 Data collection and entry

2.9.1 Ethical issues

Prior to commencement of data collection, ethical approval was sought from Lothian Health's Ethics Committee. At the time of data collection (1998/9) ethical approval was, however, deemed to be unnecessary. However, the research was conducted following ethical principles, in that, questionnaires were anonymised, with respondent identifiers kept separate from the data and in a secure location. Respondents were assured confidentiality. Further, they were notified that any information they provided to the researcher would not be shared with any health care professionals and that participation in the study would not affect the treatment they received. Finally, they were informed that the data would be anonymously stored, seen only by the researchers, and reported in such a way that it would be impossible to identify them.

2.9.2 Community pharmacy questionnaire interview

Two weeks fieldwork was undertaken in 15 community pharmacies (30 weeks in total) within the Lothian Health region. This comprised over 700 hours of fieldwork, undertaken between June and November 1998.

No problems or complaints emerged during the data collection within the community pharmacies. Users were generally very willing to take part and happy with the content

of the pharmacy questionnaires, which neither they, nor the pharmacy staff, appeared to find intrusive.

2.9.3 Non-responder minimum data collection form

As noted above, completion of the non-responder minimum data collection forms was quick and effective.

2.9.4 Telephone follow-up questionnaire interview

The lead researcher undertook all of the telephone follow-up questionnaire interviews. These were conducted between July and December 1998. A total of 718 follow-up interviews were undertaken. No major problems were encountered in this data collection effort.

Overall, the data collection progressed well, to time and on track to generate the data required to achieve the specified aim and objectives of the project (as outlined at the end of the literature chapter). The data collection effort did not realise the full 1500 target sample size. However, the 1186 pharmacy and 718 telephone follow-up interviews conducted were deemed adequate to address the aim and objectives of the research. The primary data collection phase of the project was both costly and time consuming. For these reasons it was not possible to continue further data collection to achieve the target sample size.

2.9.5 Data entry

Data entry was undertaken by University of Edinburgh data entry and management clerks.

2.10 Data analyses

2.10.1 Data structure

The core study data set comprised 273 variables, including: 1 user identifier code; descriptions of consultation routes to access P class medicine(s); previous use of primary care services and medicines; self reported health status; demographic and socio-economic characteristics. Variable name, type and description were summarised in a data code-book.

2.10.2 Data management, quality and modification

Data were primarily managed and analysed using the Statistical Package for Social Sciences (SPSS) Version 9. Respondents were identified by number only, thereby securing user anonymity and confidentiality of record, in line with data protection requirements.

Generally speaking, the data was of high quality and complete. Ideally, double entry of all data would have been undertaken to fully check the accuracy of the data entry process. This was impossible within the project time scale and resources. However, literature indicates that this may not be necessary (Robin, Reynolds-Haert & McBride, 1992; Gibson et al., 1993). As a compromise measure, the first 400 questionnaires (representing a third of all data collected) were double entered (by university data entry clerks) and questionnaires randomly selected and checked thereafter (by the researcher). Very few and only minor data entry errors were consequently detected. For example, one case had been entered twice; another only partially; and data entry had been 'mixed up' between two cases in the process of entering the follow-up telephone interview data.

2.10.3 Data cleaning

Exhaustive and detailed data cleaning was undertaken. Three main data cleaning methods were used: graphical exposition; range checks; and logical validation. Variables were charted to investigate their spread, looking out for any flat or uniform distributions that may have indicated data entry errors. Range checks were then

undertaken, using frequency counts, to identify and check for either nonsensical or outlier values. Finally, logical validation exercises were conducted to check the data for logical structure, ensuring that all questionnaire prompts and flows were adhered to and that numbers of responses matched between related sections and questions. Apparent errors or anomalies were identified, investigated and rectified. A detailed data cleaning record was kept by the researcher, identifying and documenting any changes.

2.10.4 Missing values

Incomplete or missing information was excluded from the main data analyses, analysed and written up separately and the potential implications of this, if any, for the overall results identified.

For the most part, however, the data set was complete. Only one case was completely excluded from subsequent analyses due to incompleteness. However, there was one variable for which a significant number of cases exhibited missing values – the user postcode variable (f6pcode). A number of users were reluctant to provide, could not remember, or did not know their postcode. Postcode was used to create the 'depcat' variable (f6depcat) indicating the area deprivation category within which users lived. These data were missing from 112 users who, as a result, were initially excluded from subsequent analyses using the f6depcat variable.

Discrete missing values were also detected within a limited number of cases. These appeared to be missing at random. A number of strategies were employed to overcome problems of missing data, in order to maximise the number of cases available to include in subsequent analyses. Missing values were imputed in a number of ways. For example, by substituting in mean or modal sample values; considering the distribution of values across the sample and imputing a reasonable value; and exercising judgement dependent upon the user's response to other questions. Detailed notes were kept of this process within the data cleaning record. Data analyses were run both including and

excluding the cases for which values were imputed in place of missing data. There was no observable impact on the key results.

2.10.5 Data modifications

A number of the original variables specified in the data code-book was modified to facilitate more sensitive and robust analyses. In the main, this involved recoding most of the socio-economic and demographic variables collected in the pharmacy questionnaire to either reduce the number of categories or compress variables that included an open response category option to allow for individual user response out with the pre-specified structure of the questionnaire. This was undertaken to fulfil a number of pre-requisites necessary to facilitate appropriate analyses. For example, making certain variables completely ordinal, categorical in nature; to make variables more intuitive and easier to interpret in subsequent analyses; and, in particular, to limit the number of cells violating the minimum data requirements of frequency counts of less than five within Chi-square analyses of contingency tables. As before, a detailed chronology of all data modifications and manipulations were recorded within a data management diary.

2.11 Methods of data analyses

A mixture of descriptive and stochastic analyses was undertaken. The analytical approach adopted embraced a mixture of exploratory and confirmatory analysis. Exploratory in the sense that this was a completely new data set in an area of research of which the researcher had limited prior knowledge. However, the analysis was also

confirmatory to some extent in that the investigator tested a mixture of 'common sense' predictors expected to influence outcomes, as well as associations either expected on theoretical grounds or previously identified within the literature.

The key data analyses methods employed to address the specific objectives of the study are summarised below:

2.11.1 Describing the samples

The first step in the data analyses was to undertake basic description of the study samples: profiling the sample of users accessing P medicines, identifying patterns in terms of users from different demographic and socio-economic groups; summarising the key characteristics of the community pharmacies included in the study; and enumerating the different types of P medicines obtained by users.

Descriptive analyses incorporating the use of simple graphical techniques were used to assess the distribution of the variables. Thereafter, basic descriptive statistics were used to summarise variables and draw comparisons between inter (study sample and the Lothian Health population) and intra (full and follow-up) sample characteristics, including e.g. proportions, means, medians, ranks and ranges.

Analyses proceeded by investigating associations between variables and users' choice of consultation route to access P class medicines, including: demographic and socio-economic characteristics; self-reported health status; access to and use of general practice and community pharmacy services; cost and type of medicines.

Univariate analyses were then conducted investigating similarities and/or differences in characteristics between users within the full (n=1185) and follow-up (n=718) samples; and exploring associations between user characteristics and choice of consultation. The main univariate analyses techniques included Chi-square analysis of contingency tables

examining the relationships between binary outcome variables and categorical variables; and Chi-square analyses of trend (i.e. the Mantel-Haenszel test for linear association) applied to ordered categorical data (Kirkwood, 1996).

2.11.2 Mapping the routes adopted by users to access P class medicines

The next step in the analyses was to identify and describe the routes adopted by users to access their P medicine(s). A typology of routes adopted by different groups of users was outlined and analysed according to factors hypothesised to impact on their choices including: socio-economic and demographic characteristics of users; type of drug; and price of the P drug relative to the prescription fee. As before, a range of descriptive and univariate probabilistic analyses were conducted to investigate these issues more fully.

2.11.3 Assessing the extent of substitution or complementary usage between general practice and community pharmacy services

Using the data collected in both the pharmacy and telephone follow-up interviews it was possible to detail the use of general practice and community pharmacy services for the complete history regarding the minor illness episode for which the P medicine was obtained. This data also made it possible to assess the extent of substitution or complementary usage between general practice and community pharmacy services in the use of P medicines to treat the particular episode of illness being investigated.

2.11.4 Developing a model aiming to predict users choice of access route

The next stage in the data analysis was to develop a model, identifying variables predictive of users choice of route to access their P medicine – visiting either the general practitioner or community pharmacist. Univariate (Chi-square analyses of categorical variables within contingency tables) and multivariate (logistic regression) statistical techniques were used to progress this analysis, investigating associations between user characteristics and the access route adopted, once again including: demographic and socio-economic characteristics; self-reported health status; access to and use of general practitioner and community pharmacist services; and cost and type of medicines.

2.11.4.1 Univariate analyses

Chi-square analyses were used to investigate associations between users' choice of access route (general practitioner or community pharmacists first) and variables of interest. The aim of this analysis was to ascertain if there were any statistically significant differences in characteristics between those users who opted to go to the community pharmacists to buy their P medicine over-the-counter, and those who consulted the general practitioner to obtain a P medicine on prescription. Further, the univariate analysis was undertaken to identify potential variables of interest to be included within the multivariate logistic regression analysis.

Univariate analyses can be productively employed to investigate multiple variables hypothesised to impact on users' choice to access P medicines from either the general practitioner or community pharmacist. However, a limitation with the univariate approach is that it ignores the possibility that a collection of variables, each of which is weakly associated with the outcome, can become an important predictor of outcome when taken together (Hosmer & Lemeshow, 1989). For this reason, it is also desirable to try to take account of the relationships between the predictor variables in order to determine their relative influence on users' route to obtain their P medicine. It could be that only a small number of the predictors variables actually influence the choice of consultation route adopted by the user and that other variables exhibit statistically significant univariate relationships as a result of association with the key predictor variables. Alternately, it may be that each variable has an independent effect upon users' choice of method to access their P medicine.

2.11.4.2 Multivariate analysis

Multivariate analyses were then conducted to strengthen and extend the analyses, investigating simultaneous interactions between explanatory variables. The aim was to develop a model to predict users' choice of access route. Logistic regression modelling was the multivariate method adopted.

Logistic regression modelling

Logistic regression modelling is acknowledged as the standard method for regression analysis if the relationship being investigated is between a dichotomous outcome variable and a set of covariates (Hosmer & Lemeshow, 1989). It is a data analysis technique used to derive an equation to predict the probability of an event, given one or more predictor variables. It assumes the natural logarithm of the odds for an event ('the logit') is a linear sum of weighted values of the predictor variables. The weights are derived from data using the methods of maximum likelihood (Gold et al., 1996). Logistic regression methods were chosen given the binary nature of the outcome variable of interest – user's choice to access their P medicine from either a community pharmacist or general practitioner. The strength of this method is that it accounts for the complex, simultaneous interactions between explanatory variables, aiming to determine the contribution of each to eventual outcome.

In line with other statistical model building techniques, the aim of logistic regression is to find the best fitting and most parsimonious model to describe the relationship between an outcome (dependent) variable and a set of independent (predictor) variables (Hosmer & Lemeshow, 1989).

Given the non-linear characteristic of the dichotomous outcome variable of interest in this study, the logistic regression model applies a logistic transformation of the dependent variable in order that the substantive relationship remains non-linear but the form of the relationship is linear. Put another way, the logistic transformation ensures that the relationship is non-linear in terms of its variables and but linear in terms of its parameters. In this way, a linear probability model is developed and can be analysed using standard iterative regression techniques (Collett, 1999). In particular, maximum likelihood techniques are used to maximise the value of a function, the log likelihood function, which indicates how likely it is to obtain the observed values of the dependent variable, given the values of the independent variables (Menard, 1995).

A number of other methods are available to transform the data to facilitate regression analysis (e.g. the probit or complementary log-log transformation). However, the logistic transformation was selected for a number of reasons. From the mathematical point of view, it is an extremely flexible and easily used function that is conceptually more convenient (Hosmer & Lemeshow, 1989; Collett, 1999). More importantly, however, it lends itself well to meaningful interpretation as it has a direct interpretation in terms of the logarithm of the odds in favour of a success (Hosmer & Lemeshow, 1989; Collett, 1999). Hosmer and Lemeshow summarise the merits of the logistic regression model noting: "unless we are dealing with a set of data where most of the probabilities are very small or very large, or where fit is very poor in an identifiable and systematic manner, it is unlikely that any alternative model will provide a better fit" (Hosmer & Lemeshow, 1989).

Two main approaches to model building strategies using logistic regression techniques were considered: purposeful selection of variables to be included in the model, moving from general to specific models; and stepwise methods, referring to decisions made by computer algorithms to select predictors for inclusion or removal from the model (Menard, 1995). There are advantages and disadvantages associated with each of these approaches to model building.

Advocates of the purposeful selection of variables by the researcher, argue that this approach offers potential to include all scientifically relevant variables; pointing out that it is less deterministic, according the researcher more control over the analysis; more readily permitting him/her to consider a broader range of potential predictor patterns; and facilitating as complete control of confounding as possible. However, these advantages need to be balanced against the practical considerations that purposeful selection and model building can be very time consuming (e.g. only ten pairs of predictor variables yield a 1000 regression equations to consider) and can result in over-fitting the model (Hosmer & Lemeshow, 1989).

Proponents of stepwise procedures note that it is particularly suitable for predictive and exploratory research (Hosmer & Lemeshow, 1989; Menard, 1995). They contend that in purely predictive research, investigators are not concerned with causality but rather with identifying a model that accurately predicts the outcome in question (Menard, 1995). Further, they note that stepwise methods are particularly useful for exploratory research in new areas of study where existing 'theory' amounts to little more than empirically unsupported hunches (Menard, 1995). In these circumstances, stepwise approaches may be concerned mainly with theory construction and development as opposed to theory testing (Hosmer & Lemeshow, 1989; Menard, 1995). Another advantage of stepwise procedures is that they offer a fast, effective way to screen a large number of variables, simultaneously fitting a number of logistic regression equations. Further, they are intuitively appealing in that they build models sequentially and facilitate examination of a collection of models, which might not otherwise have been examined (Hosmer & Lemeshow, 1989).

Critics of stepwise approaches believe them to be overly deterministic, resulting in model development and choice by computer algorithms adhering to a fixed decision rule, rather than researchers' judgement which some believe to be tantamount to an admission of ignorance about the phenomenon being studied (Hosmer & Lemeshow, 1989; Menard, 1995). In particular, critics of stepwise procedures believe them to be inappropriate for theory testing as they capitalise on random variations in the data (Menard, 1995). Mechanical selection procedures, such as those employed in stepwise approaches, can also select irrelevant or 'noise' variables and produce idiosyncratic and implausible models, the results of which can prove difficult to replicate in other samples (Hosmer & Lemeshow, 1989; Menard, 1995).

Notwithstanding these criticisms, stepwise logistic regression techniques were employed in the analysis of the study data. There were four main reasons for this choice. The general approach to the research study presented is exploratory. Whilst there is a

significant amount of research on use of general practice services, investigation of user response to the policy initiative to encourage increased self-medication using P class medicines is relatively under-researched. Even less attention has been dedicated to theoretically modelling social and cultural influences in this area. The outcome being studied is relatively new and the important covariates are not known and associations with the outcome not well understood. In the absence of theoretical frameworks, a more 'qualitative' approach was adopted. Further, the specific aim of the regression analysis is to develop a model useful for predicting users' choice to visit either the general practitioner or community pharmacist to access P class medicines, for the practical purpose of appraising the success or otherwise of current policy initiatives and potentially informing future policy development in this area. Theory construction and development, while welcome, were secondary to this aim. Finally, while the researcher acknowledges the potential dangers associated with the more mechanical stepwise procedures for regression model building, the researcher also believes that these can be overcome by critically reflecting throughout the model building process on the potential pitfalls of the method and closely scrutinising resultant models, identifying their strengths and weaknesses. For these reasons, stepwise techniques were adopted in the logistic regression model building. More detail on the steps involved in building the model and the results of checking its robustness are outlined in Chapter 4.

2.11.5 Investigating the changing distribution of costs and consequences

The next phase of data analysis involved: undertaking a costing analysis enumerating, quantifying and valuing key stakeholder costs; modelling costs associated with varied policy scenarios; conducting consumer surplus analyses investigating alternate prices faced by users in accessing medicines; and conducting economic evaluation to assess the relative efficiency to society associated with alternate routes to access P medicines.

Two related economic methods were applied to address these questions: consumers' surplus analyses and economic evaluation.

2.11.5.1 Consumers' surplus analyses

Consumers' surplus "measures the difference between what consumers have to sacrifice (in terms of time and money) to consume a good and what they would be willing to pay. It is, therefore, a measure of the net benefit an individual derives from consumption" (Lipsey, 1987; Ryan & Yule 1990); i.e. it calculates the net consumption benefits to users facing different time and money costs, depending on their route to access a P medicine. This was the main application of consumers' surplus in this study – examining the impact on both consumer's and consumers' surplus associated with the different costs (change in relative prices) associated with accessing P class medicines in the treatment of minor ailments via alternative access routes.

The basic principles of consumers' surplus were outlined in the literature review. In summary, the key assumptions underpinning demand theory and consumer surplus analysis are as follows:

- A linear demand function (Ryan, in Bond, 2000; Blaug, 1996);
- The commodity concerned is 'unimportant' and accounts for a small fraction of the consumers' total purchases (Lipsey, 1987);
- The marginal utility of such a good is equal to its price, assuming that the marginal utility of income is treated as a constant (Blaug, 1996);
- The marginal utility of consumption of all other goods is not affected by the variations in the amount of money spent on the (unimportant) commodity (Lipsey, 1987);
- Consumers' surplus addresses the collective gain or aggregate surplus of all buyers in the market by assuming that most markets are homogenous with respect to the income class of buyers (suggesting that the individual is a modal representation of the group) thus ensuring additivity (Blaug, 1996);

- All individuals face the same costs (prices) (Ryan & Yule, 1988;Ryan & Yule 1990);
- Costs can be broadly defined to include both monetary and non-monetary (e.g. time) components (Ryan & Yule, 1988; Ryan & Yule, 1990);
- Users possess reasonably good information about the benefits and costs to them from consuming the commodity in question (otherwise their demand function would not be meaningful) (Blaug, 1996).

Data collected in both the pharmacy and telephone follow-up interviews elicited detailed information on the differential time and resource costs faced by users, depending on the route they adopted to access their P medicine(s). Actual cost to users of their chosen method to access their P medicine was calculated, as was the potential cost to them had they opted for the alternate route available to them; i.e. the changing cost to users of substituting a general practitioner consultation in place of a community pharmacy visit to access a P medicine (or vice versa) were estimated. The difference between the costs faced by users in each of the two routes to access their P medicine represents their individual consumer's surplus (this figure could be either positive or negative, depending on whether the alternate decreased or increased the cost faced by the user).

A modelling exercise was then undertaken to compare the impact on net benefit to users and the health sector resulting from numerous hypothetical consultation scenarios on our sample including e.g. net benefit if all users had attended their general practitioner exclusively to secure a prescription for their P medicines; or net benefit if all users had attended their community pharmacy exclusively, buying a P medicine over-the- counter.

2.11.5.2 Economic Evaluation

Economic evaluation may be defined as: "the comparative analysis of alternative courses of action in terms of both their costs and consequences" (Drummond, O'Brien & Stoddardt, 1987).

The economic evaluation outlined in this study is concerned with identifying, measuring and valuing the costs and consequences, and thus the relative efficiency, of alternate ways to access P class medicines.

The study outlined employs both partial and full economic evaluation techniques. It begins by undertaking a cost analysis, enumerating, quantifying and valuing the key cost elements accruing to the main stakeholders.

A cost minimisation analysis (CMA) was then undertaken to extend the cost analysis to a full economic evaluation. This step investigated the relative costs to different parties of accessing P class medicines via one of two main access routes: either on prescription from the general practitioner or purchased over-the-counter under the supervised sale of a community pharmacist. In theory, the clinical outcomes experienced by any user associated with using particular P class medicines to treat a particular episode of a minor ailment should be identical, regardless of whether the medicine was obtained over-the-counter from a community pharmacist or on prescription from a general practitioner. For this reason, (approximate) equivalence in health outcome was assumed.

Finally, efforts were made to consider a broader range of indirect and/or intangible costs and consequences that may also have been of relevance to the user's choice of consultation route and their importance. In particular, the goal was to elucidate factors (not readily captured within either consumers' surplus or economic evaluation techniques) that influence consumers to choose the over-the-counter source of supply in preference to the prescription route for selected medicines.

In the telephone follow-up interviews, users were asked two open questions aiming to elicit their views on increased use of community pharmacies and P medicines. The transcripts from these interviews were coded according to emergent themes, those within the literature and their relevance to the study research questions considered. A pilot-

coding frame was developed using a randomly selected 10% sample of follow-up questionnaires. These were then recoded, blind, by the researcher to check the accuracy of the coding scheme and ensure that codes had been applied consistently. A further, randomly selected, 10% sample was selected and coded applying the modified coding frame. This same sample was then given to a second researcher who coded them again (blindly) and checked afterwards for sense and consistency in the application of the codes. Inter-rater agreement was high. Thus, the remaining follow-up questionnaires were coded and the data entered. Copies of the coding frames applied are included in Appendix 2.

The general approach and key stages of economic evaluation were outlined in the literature review and summarised in table A1.1 in Appendix 1. Below is a summary of the more detailed methodological decisions and assumptions applied in the economic evaluation conducted in this study. For ease they are presented in the order of the key stages, as outlined by Drummond et al., (1997).

The study question, alternatives compared and viewpoints for analysis

The economic evaluation outlined in this study was concerned with identifying, measuring, valuing and comparing the costs and consequences (intermediate) and thus the relative efficiency, of the two routes via which users can access P class medicines: (1) through a general practitioner prescription, either issued in repeat prescription mechanisms or in the course of a consultation; and (2) by buying a P medicine over-the-counter in the course of a supervised sale within a community pharmacy.

This evaluation was undertaken in the context of an implicit shift in policy encouraging people increasingly to self-medicate their minor illnesses using P class medicines, accessed from community pharmacies, and formed part of broader demand management, cost containment and graduated access strategies within primary care.

The economic analysis adopted a societal perspective. This is generally acknowledged to be the best perspective as it is the broadest and always relevant (Gold et al., 1996; Drummond, O'Brien & Stoddart, 1997). Its strength is that it ensures that all key parties affected by the intervention are represented, counting all significant costs and consequences that results, regardless of to whom they accrue (Gold et al., 1996). The societal perspective was felt to be particularly relevant/useful in this study, given its specific aim to investigate how costs may be shifted between sectors. While the study adopted a general societal perspective, it also considered a range of other main perspectives including those of patients, the health care system and specific sectors within it (e.g. general practice and community pharmacy) (Reinhardt, 1997; Gold et al., 1996). Thus, costs were identified, measured and valued separately, from each perspective, and secondary analyses presented from the point of view of specific interests and results compared (Gold et al., 1996).

The options being evaluated

The economic analysis in this study investigates two alternative routes to access P medicines for use in the treatment of minor illnesses: via prescription obtained from a general practitioner, or purchased over-the-counter in the context of a supervised sale by a community pharmacist. These two alternatives were selected for investigation as they were the most pertinent. Accessing P medicines from the general practitioner on prescription may be regarded as the traditional access route; and buying them over-the-counter from the community pharmacist the newer option, which has been promoted in recent years via the increasing deregulation of previously prescription only medicines (POMs) to pharmacy available (P) status (i.e. POM to P shifts). This reflects a government(s) policy shift encouraging increased use of community pharmacists in the management of minor ailments, a central plank of broader demand management and graduated access strategies within primary care, recently introduced. These two options currently represent the main two routes via which users can access P class medicines within primary care. They reflect 'real world' practice and were believed to be the most

appropriate comparators relevant for assessing the relative costs of accessing P class medicines.

Two other potential alternatives currently exist in which users can access P class medicines: from a nurse prescriber and direct from a community pharmacist, still on prescription, via pilot liaison schemes with general practitioners (Whittington et al., 2001; Salisbury et al., 2002a; Schafheutle et al., 2003). These alternatives were, however, excluded from consideration, for two main reasons. Firstly, they have typically been introduced in pilot study developments, involving smaller number of users and/or only specific medicines and conditions. This study wanted to investigate current 'usual' practice. Further, it wanted to include all potential users of all P medicines. Secondly, these developments have already, or are currently subject to evaluation of their developments (Whittington et al., 2001; Salisbury et al., 2002a; Schafheutle et al., 2003; Sheehy & Jones, 2003). Thus, these alternatives were excluded from this study.

Often economic evaluations include a 'do-nothing' or 'status-quo' comparator option. However, given the explicit promotion of the community pharmacy route within the current policy environment, this was not considered appropriate. Effectively, the two routes adopted currently constitute the 'defacto' statusquo, which, until now, has not been evaluated.

Relative effectiveness of the two options

Full economic evaluations should consider issues relating to programme effectiveness (Gold et al., 1996). A cost minimisation analysis is the main economic evaluation methodology being applied. This technique requires the assumption that health outcomes are presumed to be equal. This is the case in this study. This assumption is predicated on the fact that there is no reason to expect that clinical efficacy of P medicines is affected by the route via which users access them. Indeed, these and other safety related considerations feature strongly in decisions by the Committee for Safety

of Medicines in the licensing of P medicines (OTC Directory, 1995). Occasionally, slightly different licensed indications are introduced for the same drugs (e.g. regarding dosage, pack size and use of certain P medicines) which, in certain cases (e.g. large pack sizes) may result in them being considered to re-enter the prescription only (POM) category. This is the case, for example, in the availability of H_2 antagonist medicines. However, conditions of availability and appropriate use of medicines for the alleviation of minor conditions, which come under a P classification, should be very similar (over populations of users) whether bought over-the-counter or obtained on prescription. One would expect them to be equally efficacious in the management of minor ailments, if used appropriately, in line with their licensed indications.

The range of costs and consequences considered

Efforts were made in this study to at least outline, if not necessarily include, the whole range of potential costs and consequences associated with the two alternatives under investigation. Given the societal perspective adopted in the study, efforts were made to cast the evaluation net as widely as possible to identify relevant cost and consequences overall, but also to consider the particular groups to whom they potentially accrued – namely society, the NHS (general practitioners and community pharmacists specifically) and users and their families.

It was recognised at the outset that this study would involve investigating small differences in costs to large numbers of individuals over significant volumes of health care activity. Differences in cost between the two access routes were not expected to be very large. Thus, considerable effort was devoted to identifying differences in resource consumption at a micro level.

For these reasons, as well as financial and time constraints of the research, the study 'boundaries' were necessarily confined to identification of only the most important costs likely to impact on results. The time horizon adopted for the collection of costs and consequences information was determined in line with the nature of minor ailments

concerned. On the advice of primary care professionals, an appropriate time window was estimated to be within a range of between two to four weeks. Cost data were, thus collected for this time period.

Calculation of long run marginal opportunity costs is the general theoretical ideal within economic analyses (Netten & Beecham, 1993; Knapp, 1995; Gold et al., 1996). However, an accepted costing convention is the use of short run average revenue costs, supplemented with appropriate capital and overhead allocation, as a proxy for long run marginal opportunity cost (Hallam et al., 1994; Drummond et al., 1997). This was the costing approach adopted in the study.

Three main types of costs and consequences are generally considered relevant within economic evaluation – direct, indirect and intangible. Methodological and time constraints often mitigate against the inclusion of intangible costs and consequences within economic evaluations. For exactly these reasons, they were excluded from consideration in this study. The specific costs and consequences included in this study, differentiated by type (direct and indirect) and relevance to various perspectives are summarised in table 2.1 below.

TABLE 2.1: STUDY COSTS UNDER ALTERNATIVE PERSPECTIVES

Cost Element	Societal Perspective	Patient & Family Perspective	Health Sector Perspective
Medical care (aggregate)	All medical costs	Out-of-pocket (OOP) expenses	Covered services
'Units'	All Units	If paid OOP	Services covered
'Price'	Opportunity cost	Price paid OOP	Amount paid & administration costs
Patient time costs for treatment	Cost of all time used *Travel, waiting, appointment or advice time*[*] *Time off work*[#]	Opportunity cost to patient *Travel, waiting, appointment or advice time*[*] *Time off work*[#]	None
Formal care-giving	All costs (capital & operating) *GP consultations*[*] *CP consultations*[*] *Medicines*[*] *Prescription charge*[*] *Price over-the-counter medicine*[*]	Out-of-pocket (OOP) expenses *Prescription charge (if paid)*[*] *Over-the-counter medicine price*[*]	Covered services *GP consultations*[*] *CP consultations*[*] *Medicines*[*] *Prescription system*[*]
Informal care-giving	All costs *Family & volunteer time*[#]	Opportunity cost to caregiver *Family & volunteer time*[#]	None
Transportation and other non-medical costs	All costs *Travel costs*[*] *Childcare & other special arrangement costs*[#]	All costs *Travel costs*[*] *Childcare & other special arrangement costs*[#]	None
Sick leave and other transfers[&]	Administration costs only *Prescription medicine system*[*]	Amount received *Prescription exemptions received (if any)*[*]	Amount paid & administration *Prescription medicine system*[*]

Adapted from Gold et al., 1996 p. 186 Table 6.1

[*]Direct cost
[#]Indirect cost
[&]Money transfers which do not reflect resource consumption are called transfer payments (Drummond et al., 1997).
'Transfer payments' (e.g. cash transfers from tax payers to welfare recipients) associated with an intervention, redistribute resources from one individual to another. While the administrative costs of such transfers should be accounted for, the transfers themselves are not since, by definition, their impact on the transfer and recipient cancel out (Gold et al., 1996).

Three main categories of health outcomes are usually relevant to economic evaluations – physical, social and emotional functioning of individuals (Drummond et al., 1997). However, given the methodological and practical difficulties outlined earlier, health outcomes are not explicitly considered in this study. Instead, intermediate outcomes only are measured and compared. Given the doubts over the validity/appropriateness of attempts to measure health outcomes in this study and the absence of available instruments to do so, use of intermediate outcomes only was inevitable. However, this need not be regarded as a limitation of the study. If the purpose of the evaluation is only to guide allocation among options yielding approximately equivalent results and after effects, then intermediate outcomes can be very useful (Gold et al., 1996). Both of these conditions are satisfied in the study outlined.

Measurement of costs and consequences

An 'ingredients' cost approach was adopted in the evaluation. The identification, measurement and valuation of the costs and consequences was carried out in separate steps. Once identified, they were measured in appropriate natural or physical units (Drummond et al., 1997). Primary data collection was undertaken to enable this approach to the valuation of costs and consequences to be adopted. To facilitate accuracy, respondents were explicitly asked to identify only the incremental costs and consequences i.e. only those that they would not otherwise have incurred. This enhances the usefulness of the study, making its key steps transparent and allowing analysts to apply different valuations, if necessary, to reflect their particular decision-making context.

The boundaries set for the study, alongside some methodological considerations explicitly constrained the analysis to include only the key direct and indirect costs and consequences of relevance and felt likely to potentially influence any decisions. Further, the collection was restricted to a one-month time horizon. As a result, certain costs and consequences were omitted from consideration. Consequentially, consideration of

adverse events and side effects and associated sequelae, as well as intangible costs and consequences were excluded in subsequent analyses.

Given that primary data collection was conducted, no particular measurement difficulties emerged. There were, however, some unavoidable uncertainties. The main example concerns potential joint use of resources within both the general practice and community pharmacy consultations. There were undoubtedly cases where the consultation dealt with issues other than those related to the minor illness episode. Thus, attributing the full cost of the consultation to the minor ailment may overestimate the cost. Given the inability of the researcher to observe consultations, this was unavoidable. Thus, there may be some issues regarding appropriate allocation of cost in such circumstances of joint use of resources. This was not, however, felt to occur particularly frequently, or to have a significant impact on the cost estimates. The analysis includes some differential assumptions about the length of consultations, in a bid to try to account for such uncertainty.

The valuation of costs and consequences

Prospective data collection allowed key time and financial costs to be estimated and combined for each user's consultation route, resulting in an individually based methodological approach (Donnelly et al., 1994). Market prices were mainly used to proxy opportunity costs associated with resources depleted in the alternatives. Local or patient specific data were used to calculate costs where possible. Where these were unavailable, time and cost estimates were supplemented using national data sources (e.g. Department of Transport and the Environment, 1997; Office for National Statistics, 1998 a-e) national unit cost estimates (e.g. Netten, Dennett & Knight, 1998; Office of Health Economics, 1999) or previous estimates within the literature (e.g. Scottish Executive, 1999; BMA & RPSGB, 1998). In general though, robust time and cost estimates were sourced via primary data collection from 'real' users. All cost data are reported in UK pounds sterling, at 1998/9 prices, applying a range of high, medium and low cost estimates.

A range of different costing techniques may be applied to estimate long run marginal opportunity costs. However, two main methodological approaches to costing exist – micro and gross costing techniques (Gold et al., 1996). Micro costing may be regarded as a 'bottom-up' approach (Gold et al., 1996). It is highly specific and involves compiling a detailed inventory and measurement of all the inputs employed within an intervention (Gold et al., 1996). By contrast, gross costing adopts a more 'top-down' approach, seeking to derive a satisfactory estimate of 'typical' cost of the service in question (Gold et al., 1996). It bases cost estimates on more aggregate level information on resource use (Gold et al., 1996).

Both micro and gross costing techniques were utilised in this study. There were several reasons for this. Differences in resource consumption, and therefore costs, between the two alternatives under consideration were felt likely to be small. However, volume is large. In these circumstances, only micro costing techniques would adequately illuminate differences between the options (Gold et al., 1996). In addition consideration of the distributional consequences to key stakeholders are more easily identified via micro costing techniques. Further, micro costing methods are more appropriate for programmes and events occurring in the present (Gold et al., 1996). In calculating costs of the programmes, consideration also had to be given to both the time and effort required to achieve robust results and also their generalisability, given the national policy significance associated with the promotion of self-medication for minor illnesses. Thus, a compromise or hybrid micro-gross costing approach was adopted in this study. Time differences to key stakeholders (i.e. general practitioners, community pharmacists and users) and their associated cost implications were perceived a priori to be the crucial difference between the two access routes available to access P medicines. Although involving fairly small time differences, within the context of single consultations, in aggregate they are likely to be substantial. Further, in order to investigate the changing distribution of costs across key stakeholders, detailed estimates are required. For these reasons, a micro approach was adopting, identifying specific estimates from users regarding key time costs associated with the consultation route adopted (i.e. travel,

waiting, consultation, dispensing and advice-giving times). Acknowledging the national policy pertinence of the study, gross cost estimates were applied (e.g. using national unit costs to calculate the costs of general practitioner consultations). This approach highlights resource implications on average, across different local contexts and settings. However, efforts were made to sensitise gross costs. For example, although national (average) unit costs for general practitioner consultations were used, a per minute estimate for a general practitioner consultation was derived (Netten, Dennett & Knight, 1998). Staff costs were then calculated by multiplying the relevant per minute consultation cost by the differential time estimates, thereby deriving a very sensitive proxy cost for each element. This avoided simply attributing crude average cost estimates.

User time costs were calculated a similar fashion. Whilst there has been some methodological debate about the appropriateness of including user time costs, a consensus has emerged that time resources supplied by users have a positive cost and thus should be included and valued at their opportunity cost to society (Becker, 1965; Propper, 1994; Santerre & Neun, 1996; Cauley, 1987; Dept. of Transport, 1997; Janssen, 1992). This approach is consistent with the theoretical foundations of economic evaluation (Posnett and Jan, 1996). It is clear that when two interventions are very similar, except that one requires more user time to obtain, they are not equally desirable (Gold et al., 1996). This is the case in the present study. Time, like money, is a limited resource that can be devoted to other uses (Gold et al., 1996). For this reason, it was crucial to include time costs in the analysis. Further, the societal perspective adopted in the evaluation requires it.

Valuation of user time costs is also highly contentious. The proxy value attributed to time depends on whether it is waged or unwaged; i.e. whether it relates to unpaid employment or leisure time (Smith & Wright, 1994; Netten & Dennett, 1993; Ryan, in Bond, 2000; Department of Transport & Environment, 1997). Different estimates are available for each. Mindful of these controversies, the study used a number of different

wage estimates, reflecting both waged and unwaged (leisure) time. As with estimates of professional time, user time costs associated with alternative routes were estimated and combined with the range of wage estimates deemed most appropriate. Given the macro policy relevance of the study and the societal perspective adopted in the study, national average hourly wage rate estimates were ultimately considered to be more appropriate than age/gender specific ones. A key factor influencing this decision was acknowledgement that, in this study, users of community pharmacy services were predominantly women, who were often accessing P medicines on behalf of various family members. In these circumstances, use of gender specific wage rates was felt likely to underestimate the true cost of user time associated with use of community pharmacy services. Thus, for both these reasons, use of national average wage rates seemed methodologically more appropriate. It was not deemed appropriate or acceptable to elicit users' wage levels within the context of a fairly public interview. Further, community pharmacists objected to this suggestion. Ultimately, many of the methodological nuances associated with attributing appropriate opportunity cost values for lost working time may be a little academic, as only a small proportion of users in the study actually attended services within work time. Nonetheless, user time costs were enumerated and valued separately, thus making them transparent, allowing individual decision makers to gauge their relevance (Drummond et al., 1997).

Thus, micro time and resource estimates were combined with sensitised gross cost estimates. In this way, the methods aimed to encapsulate the subtle but important time differences between the alternate access routes, applying cost estimates relevant from a national policy perspective.

Other relevant costs, in particular, medicine(s), travel and childcare costs, also needed to be included. Costs of medicines were calculated in three ways. If obtained on prescription, the cost to the health sector was calculated using national average estimates of the net ingredient costs of medicines per item obtained, or the average cost per item,

depending on the classification the medicine was included under within the British National Formulary (BMA & RPSGB, 1998). Costs to users of medicines purchased over-the-counter were proxied by their market price. This is likely to overestimate these costs to society, as the over-the-counter price inevitably includes a margin for profit (although the profit margin within the price does represent a cost to the user).

Costs to users of obtaining medicines on prescription were estimated at the prescription charge (£5.80 per item) if the user was eligible to pay for their prescription medicines and zero if they were not. Cost of prescription medicines to users in possession of a prescription season ticket, was estimated to be the monthly cost of their ticket. No cost was attributed to prescription exempt users as prescription medicine benefits constitute a transfer cost (i.e. payments made on, or on behalf of, individuals (usually by a government body) that does not perform any service in return) (Gold et al., 1996). Such transfer payments involve redistribution of money, and as such, do not incur real costs to society.

Two other categories of costs were calculated for users – travel and childcare costs. Other research indicates that these are important indirect costs and can influence user access to services (Pearson et al., 1993). User travel costs were estimated, depending on the mode of transport used and the time taken travelling to access medicines. A range of travel estimates was calculated for travel via public transport, train, taxi and private car. Similarly, childcare costs were calculated by applying estimates of local childcare costs or attributing a cost for leisure time forgone by family members providing childcare necessary to allow the user to consult either the general practitioner or community pharmacist to obtain a medicine.

Two other categories of cost that merited consideration for inclusion were capital and overhead costs. They were, however, only partially embraced. The national unit cost figures used for general practitioner consultations incorporate both capital and overhead cost allocations in their estimates. Whether these national estimates reliably

approximate the capital and overhead cost profiles of general practices visited by users in this study is unknown. Doubtless variations exist.

Similarly, there is only limited consideration of the capital and overhead resources used within the bottom-up cost estimates for community pharmacy included within the study. Professional allowances paid to community pharmacies (e.g. for dispensing, advice and on-cost allowances) presumably build in some consideration to cover the capital and overhead costs associated with running them. At the time of analysis, dedicated estimates for such costs were not, available within the literature. As such, they were excluded due to the extreme difficulty in trying to apportion reliably a share of these costs, particularly given the variation in size and types of community pharmacies included in the study.

Partial and/or inadequate account for the capital and overhead costs associated with running general practice and community pharmacy services introduces a potential weakness in the cost calculated. However, this may not be a major limitation. There is much debate over how to apportion such costs to particular services or elements of practice or business. No unambiguous or right way is agreed upon. However, the favoured approach is to employ marginal analysis; i.e. to assess which (if any) of these costs would alter if a given programme was added or taken away (Drummond et al., 1997). It seems unlikely that the capital cost base of general practices or community pharmacies would alter as a result of potential changes in consultation preference to access P medicines by users, as outlined in this study. Likewise, it seems unlikely that such changes would significantly influence the overhead costs faced by these services. Overhead costs usually increase with additional output. (Gold et al., 1996) However, if users were not attending the general practitioner for a prescription for the P medicine, those consultation slots would be filled by other users. Similarly, if more or less users presented at the community pharmacy to access a P medicine, their opening hours and business practice would also be likely to remain unchanged. Thus, assuming that general practice and community pharmacy services were operating at, or near, capacity – and

that this is unlikely to change drastically if users alter their route of access to P medicines - the marginal capital and overhead costs directly attributable to particular general practitioner or community pharmacy consultations are likely to be negligible. Thus, limited consideration of capital and overhead costs were felt unlikely significantly to influence total costs and thus results.

Indeed appraisal of recent national unit cost estimates for community pharmacy, appear to confirm this. Low, mid and high gross national unit cost estimates for community pharmacy resources range between £0.50, £0.55 and £0.62 per minute respectively (including wage, training and overhead costs, at 2003 prices) (Netten & Curtis 2003). These compare reasonably closely to the bottom-up cost estimates ranging between £0.32, £0.45 and £0.59 per minute (including wage and professional allowances, at 1999 prices) calculated and applied in this study. The latter estimates are lower than the national unit cost per minute estimates. However, a number of other elements (professional fees and allowances) were separately identified and accounted for in this study which, after accounting for inflation in the period between 1999 and 2003, bring them within the same ballpark as the national unit cost estimates.

A summary of the units of resource consumption and the cost(s) per unit applied within the economic evaluation, alongside the sources used to arrive at the estimates, are summarised in table 2.2 below. Table 2.3 highlights the constituent cost elements included within the user, general practice, community pharmacy and NHS cost calculations in different access routes. The cost estimates were sensitised according to the precise circumstances associated with route adopted by individual users to access their P medicine. For example, medicine costs to the NHS were calculated according to the type and amount of medicine obtained; time estimates were those reported by individual users; and cost of medicines to users was calculated according to prescription or pre-payment certificate charges incurred or the over-the-counter price paid for medicines.

TABLE 2.2: SUMMARY OF COST ESTIMATES AND SOURCES APPLIED IN THE ECONOMIC ANALYSES

General practitioner Costs (Salary, Training, Overheads)		
Low	£0.83/minute	Locum rate (Medeconomics, 1998)
Mid	£1.25/minute	Netten, Dennett & Knight, 1998 (General Practitioner without specific training).
High	£1.62/minute	Netten, Dennett & Knight, 1998 (General Practitioner with specific training).
Community Pharmacist Cost (Salary)		
Low	£0.26/minute	Pharmaceutical Journal, 1999 a & b. Hospital Pharmacy Scales RPSGB, 1990. Scottish Executive, 1999.
Mid	£0.34/minute	Pharmaceutical Journal, 1999 a & b. Hospital Pharmacy Scales RPSGB, 1999. Scottish Executive, 1999.
High	£0.43/minute	Pharmaceutical Journal, 1999 a & b. Hospital Pharmacy Scales RPSGB, 1999. Scottish Executive, 1999.
Community Pharmacist Cost (Professional Allowance)		
Low	£0.06	Scottish Executive, Drug Tariff, 1999. RPSGB, 1999.
Mid	£0.11	Scottish Executive, Drug Tariff, 1999. RPSGB, 1999.
High	£0.16	Scottish Executive, Drug Tariff, 1999. RPSGB, 1999.
Community Pharmacist Cost (Dispensing Fee)		
Low	£0.94	Scottish Executive, Drug Tariff, 1999. RPSGB, 1999.
Mid	£0.94	Scottish Executive, Drug Tariff, 1999. RPSGB, 1999.
High	£0.94	Scottish Executive, Drug Tariff, 1999. RPSGB, 1999.

Community Pharmacist Cost (On-Cost Allowance)		
Low	17.5% of NIC	Scottish Executive, 1999. RPSGB, 1999.
Mid	17.5% of NIC	Scottish Executive, 1999. RPSGB, 1999.
High	17.5% of NIC	Scottish Executive, 1999. RPSGB, 1999.
Community Pharmacist Time Cost (Dispensing)		
Low	2.5 minutes/prescription	Savage, 1995
Mid	3.5 minutes/prescription	Savage, 1995.
High	5.0 minutes/prescription	Savage, 1995.
Community Pharmacist Time Cost (Prescription Advice)		
Low	0.2 minutes/prescription	Savage, 1995.
Mid	0.3 minutes/prescription	Savage, 1995.
High	0.4 minutes/prescription	Savage, 1995.
Community Pharmacist Time Cost (Over-the-Counter Advice)		
Low	0.5 minutes/customer	Savage, 1995.
Mid	1.0 minutes/customer	Savage, 1995.
High	2.5 minutes/customer	Savage, 1995.
User Time Costs		
Low	£3.57/hour £0.06/minute	Department of Transport & Environment - leisure time/non-working time estimate, 1997.
Mid	£7.42/hour £0.12/minute	ONS earnings survey – all industries average, 1998e.
High	£9.10 £0.15/minute	Department of Transport & Environment - national average wage rate, 1997.
Cost of Prescription Medicines		
Low	£5.80	Scottish Executive, 1999 -UK prescription charge per item, 1998.
Mid	£8.74/prescription item	Yuen, 1999 – Scottish average, 1999.
High	£8.98/prescription item	Yuen, 1999 - UK average, 1999.
Varied	£ varied	Yuen, 1999 – Net Ingredient Cost per prescription item per BNF therapeutic group, 1999.
Cost of Over-The-Counter Medicines		
Varied	£ varied	Varied over-the-counter market prices (including profit).
User Travel Costs		
Walking **High** **Mid** **Low**	 £0 £0 £0	N/A.
Bus **Low** **Mid** **High**	 £0.50/trip £0.75/trip £1.00/trip	Lothian Regional Transport, 1999.
Taxi/Train		

Low **Mid** **High**	£3.00 £4.00 £5.00	Central Taxis Edinburgh, 1999. Scotrail, 1999.
Car **Low** **Mid** **High**	 £0.40/trip £0.80/trip £1.20/trip	 University of Edinburgh Finance Dept. Private Car Allowances, 1999.
User Childcare Cost		
Low	£3/hour	Local babysitting, childminder and nursery rates. Personal communications.
Mid	£4/hour	Local babysitting, childminder and nursery rates. Personal communications.
High	£5/hour	Local babysitting, childminder and nursery rates. Personal communications.

TABLE 2.3: CONSTITUENT COST ELEMENTS INCLUDED WITHIN USER, GENERAL PRACTICE, COMMUNITY PHARMACY & NHS COST CALCULATIONS IN DIFFERENT ACCESS ROUTES

P medicines obtained on prescription in a general practitioner appointment
Medicine cost from name and quantity obtained on prescription [$]
Waiting time in general practitioner's surgery [*]
Time in general practitioner appointment [*#$]
Travel method to general practice surgery [*]
Travel time to general practice surgery [*]
Special arrangements to attend general practitioner appointment [*]
Time for special arrangements to attend general practitioner appointment [*]
Travel method to community pharmacy [*]
Travel time to community pharmacy [*]
Waiting time in community pharmacy to obtain prescription [*]
Special arrangements to visit community pharmacy to collect prescription [*]
Time for special arrangements to visit community pharmacy to collect prescription [*]
Advice time with community pharmacist [*&$]
Professional fees and allowances paid to community pharmacist [&$]
Prescription charge paid for prescription medicines (including pre-payment certificates) [*]
P medicines obtained on repeat prescription from a general practitioner
Medicine cost from name and quantity obtained on repeat prescription [$]
Travel method to general practice surgery to collect repeat prescription [*]
Travel time to general practice surgery to collect repeat prescription [*]
Waiting time in general practice surgery to collect repeat prescription [*]
Other arrangement to obtain repeat prescription (e.g. via post) [*#$]
Special arrangements to obtain repeat prescription [*]
Time for special arrangements to obtain repeat prescription [*]
Travel method to community pharmacy to collect repeat prescription [*]
Travel time to community pharmacy to collect repeat prescription [*]
Waiting time in community pharmacy to collect repeat prescription [*]
Special arrangements to visit community pharmacy to collect repeat prescription [*]
Time for special arrangements to visit community pharmacy to collect repeat prescription [*]
Advice time with community pharmacist [*&$]
Professional fees and allowances paid to community pharmacist [&$]
Prescription charge paid for prescription medicines (including pre-payment certificates) [*]
P medicine bought over-the-counter in a community pharmacy
Travel method to community pharmacy to buy over-the-counter medicine [*]
Travel time to community pharmacy to buy over-the-counter medicine [*]
Waiting time in community pharmacy to buy over-the-counter medicine [*]
Special arrangements to visit community pharmacy to buy over-the-counter medicine [*]
Time for special arrangements to visit community pharmacy to buy over-the-counter medicine [*]
Advice time with community pharmacist [*&$]
Price paid for the over-the-counter medicine bought in community pharmacy [*]

[*] indicates the elements included in calculation of user costs

[#] indicates the elements included in calculation of general practitioner costs

[&] indicates the elements included in calculation of community pharmacy costs

[$] indicates the elements included in calculation of NHS costs

Precise details of the units of resource expended (e.g. time, money costs etc.) in the course of accessing P medicines were collected from users in the community pharmacy questionnaire interview. These were operationalised to cost estimates using the statistical software package SPSS, by multiplying the costs associated with each unit (e.g. cost per minute of general practitioner, community pharmacist or user time) by the number of units consumed by each user in the course of accessing their P medicine(s). The prescription exemption status of individuals was also taken into account to ensure accurate individual user costs were derived. Low, mid and high estimates for each resource unit were collected and used to sensitise and yield a range of cost estimates for consideration.

Having identified, measured and valued all relevant cost elements associated with the two access routes, they were combined in various ways. They were reported according to the access route adopted to obtain the P medicine (i.e. on prescription from a general practitioner; on repeat prescription from a general practitioner; or over-the-counter at a community pharmacy) as well as according to the costs accruing under varied perspectives included within the analysis i.e. users, general practice, community pharmacy, the NHS and society. The costs were also combined to calculate total costs and average costs for individual users and aggregate costs at study population levels (Gold et al., 1996). Next, key cost elements were broken down according to the main categories outlined and assessed to identify the main drivers in the cost analysis. Finally, incremental costs across the different perspectives were calculated subtracting the costs associated with one access route alternative from the other (Gold et al., 1996). Both point (means and medians) and range estimates (minimum, maximum and confidence intervals) are presented.

In the telephone follow-up interview, users were asked about their perceptions of the relative advantages, disadvantages, costs and benefits associated with general practice and pharmacy consultations to obtain P medicines and the key attributes identified with each which were important in determining their route. The transcripts from these

interviews were coded according to emergent themes and those within the literature generally and their relevance to the study research questions considered.

The timing of costs and consequences

It is considered good practice within economic evaluation to take account of any differential timing of costs and consequences (Drummond et al., 1997; Gold et al., 1996). This requires future costs and consequences to be 'discounted' to 'present values'. However, given the relatively short time spans associated with the two alternative programmes under consideration in this study, the application of discounting techniques was not felt to be either necessary or appropriate.

Incremental consideration of costs and consequences

Analysts should investigate the sensitivity of their results of distinguishing between total, average, marginal and incremental costs. Incremental analyses enable us to examine the differences in cost or effect between rival programmes (Drummond et al., 1997). It helps us to address the question 'how much extra benefit, at what additional cost'? Clearly, however, opportunities to reallocate resources will differ from place to place for rival programmes (Drummond & Jefferson, 1996). As such, analysts usually present total and average costs as their baseline comparators within the primary analysis and address marginal and incremental consideration within their discussion (Drummond, 1996). This will be the approach adopted in this study.

Consideration of uncertainty on the analysis

Robust economic evaluations will endeavour to account for uncertainty in their cost and consequence estimates and probe the robustness of their methods and findings (Sloan, 1997). This is usually achieved by applying techniques of sensitivity analysis (Briggs, Sculpher & Buxton, 1993). Various forms of sensitivity analysis were undertaken in the present study, investigating potential uncertainties related to data and cost estimates and methodological assumptions. Alternate data and methodological assumptions were employed, assessing the sensitivity of the key study results to such change. (These were

derived either from literature estimates, expert opinion or applying estimates from the means within the data (Drummond et al., 1997).

Comprehensive discussion of the results

The results of economic evaluations should be made as transparent as possible. The study presented endeavoured to achieve this by addressing a number of important considerations in the presentation of the results, including: outlining potential limitations and qualifications; clearly stating underlying assumptions and value judgements; considering generalisability issues; considering distributive and ethical implications of the findings; presenting meaningful qualitative description of the results and considering policy implications emerging from the study.

Chapter 3:

Sample Characteristics; Access; Extent of Substitution; and User Views on Accessing P Medicines from Community Pharmacies

3.1 Introduction

There are four key objectives within this chapter, to: (1) profile the samples (full and follow-up) of users accessing P medicines, identifying patterns of use among different demographic and socio-economic groups, as well as different types of medicines; (2) map the routes adopted by users to access P class medicines; (3) assessing the extent of substitution or complementary usage between general practice and community pharmacy services as a result; and (4) outline general user views on use of community pharmacies and increasing availability of P medicines.

3.2 Sample(s) characteristics

3.2.1 Response rates

3.2.1.1 Community pharmacies

Fifteen of the seventeen community pharmacies approached agreed to participate. Potential disruption to their business and inability to house a researcher, due to limited physical space, were the reasons given by the two community pharmacies declining to participate in the study. A total of 30 weeks or 700 hours of fieldwork was undertaken in these fifteen pharmacies. All days of business (including weekends) and opening hours (including late nights) were covered.

3.2.1.2 Users – pharmacy interview

A total of 1563 users were approached within the 15 community pharmacies and invited to participate. Approximately 1 in 4 (378/1563) of the users approached

(24%) declined to take part. A total of 1186 users agreed to participate (survey response rate 1186/1563; 76%), and 760 users agreed to be followed-up (overall survey follow-up rate 760/1563; 49%). Just under a third (31%) of participants were visiting the pharmacy on behalf of, or as a ' proxy', for another person (this figure is very similar to literature estimates that suggest that between 27-30% interactions within community pharmacies involve proxy visits) (Rogers, Hassell & Nicolaas, 1999).

Total number of respondents within community pharmacies ranged between 20 to 164 users and non-response rates ranged, between 9% to 40%. The exact breakdowns, alongside community pharmacy type and location are summarised in table 3.1.

TABLE 3.1: PHARMACY LOCATION AND TYPE, TOTAL NUMBER OF RESPONDENTS AND RESPONSE RATES BY PHARMACY

Pharmacy Location	Pharmacy Type	Area Deprivation Category of CP Location*	Total No. of Respondents	% of Total Sample	% Non Response Rate
Bathgate	Chain	Average (4)	164	13.8	18 (37)
Blackburn	Chain	Deprived (5)	131	11.1	16 (25)
Livingston	Chain	Average (4)	116	9.8	36 (64)
Edinburgh Broughton St	Chain	Average (4)	114	9.6	30 (48)
Balerno	Independent	Affluent (2)	106	8.9	20 (27)
Edinburgh Comely Bank	Chain	Affluent (2)	106	8.9	18 (24)
Edinburgh Corstorphine	Chain	Average (3)	93	7.8	26 (33)
Bathgate	Chain	Average (4)	78	6.6	20 (20)
North Berwick	Independent	Average (3)	68	5.7	31 (30)
Dalkeith	Chain	Average (4)	49	4.1	9 (5)
East Linton	Independent	Affluent (2)	41	3.5	21 (11)
Penicuik	Chain	Average (3)	36	3.0	36 (20)
Edinburgh Niddrie	Independent	Deprived (5)	35	3.0	24 (11)
Edinburgh Dalry Rd	Chain	Average (4)	28	2.4	40 (19)
Fauldhouse	Independent	Deprived (5)	20	1.7	17 (4)
Totals	**N/A**		**1185**	**100**	**N/A (378)**

Note: * the figure in brackets represents the deprivation category from which the majority of respondents within each pharmacy lived.
The Carstairs deprivation index was used (1-2=Affluent; 3-4=Average; 5-7=Deprived) (Lothian Health, 1996a).

3.2.1.3 Users – telephone follow-up interview

760 (64%) users gave permission to be followed-up by telephone. 718 users were successfully followed-up, representing 61% (718/1185) of the full sample. The loss to follow-up of 42 users occurred for a number of reasons, including: provision of an invalid telephone number; the user had moved away; the user was working away from home long-term; or the user was repeatedly unavailable to participate.

3.2.2 Sample(s) descriptions

3.2.2.1 Sample description - community pharmacies

Figures 3.1 to 3.4 summarise the key characteristics and locations of the community pharmacies included within the study. Lothian Health definitions of the geography (west, mid, city and east) and location (town, city centre, suburban and rural) of community pharmacies were used (Lothian Health 1996a).

FIGURE 3.1:

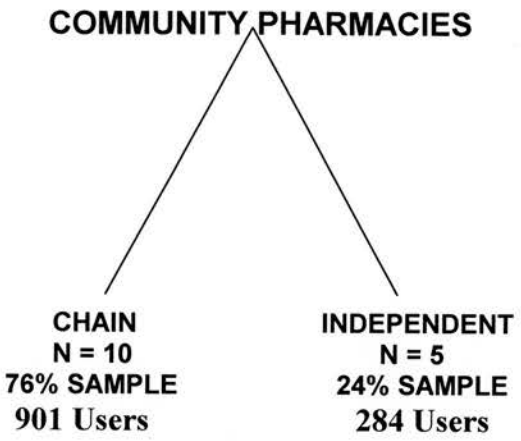


FIGURE 3.2:

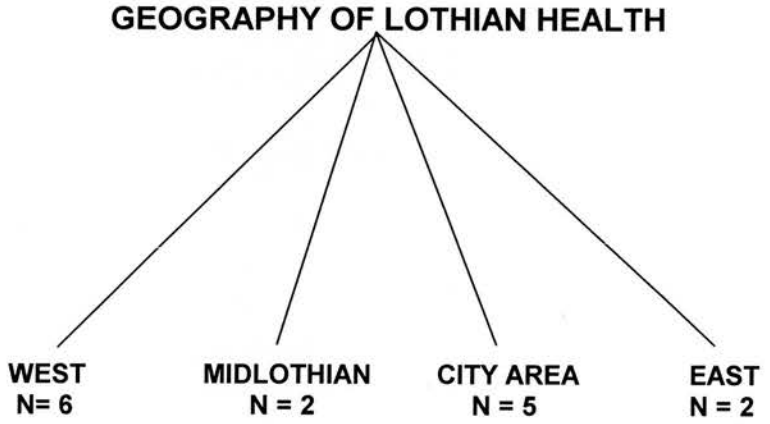


FIGURE 3.3:

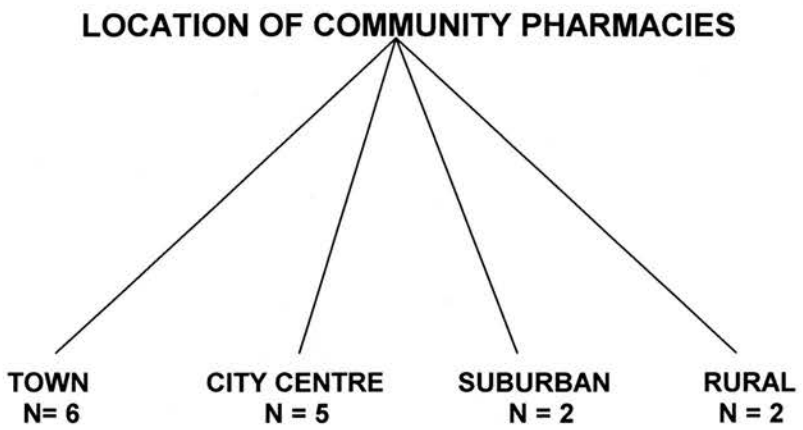


FIGURE 3.4:

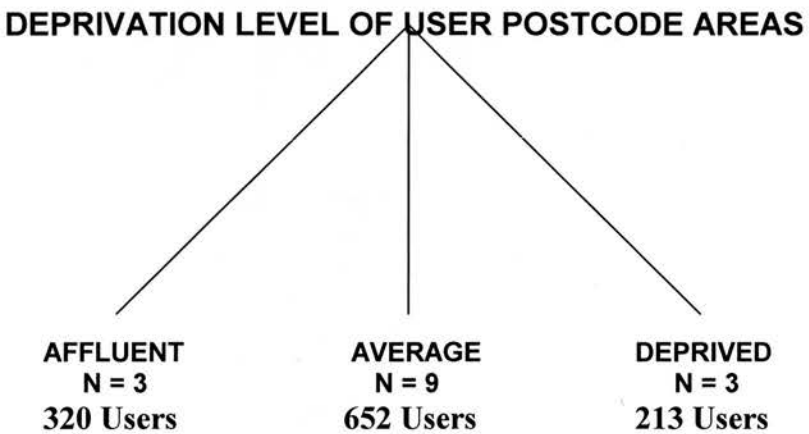


Figure 3.1 highlights that the study pharmacies included ten that were part of a multiple or small retail chain group and five that were independently owned. Three-quarters of the sample were recruited within chain pharmacies and a quarter within independently owned community pharmacies.

Figure 3.2 highlights the geographical spread of the 15 study community pharmacies and demonstrates that the whole of the Lothian Health area was covered. The exact locations the community pharmacies are pinpointed on an area map adjacent.

Figures 3.3 and 3.4 show that the pharmacies were located in a variety of different area types and across all of the deprivation categories within the Lothian Health area.

3.2.2.2 Sample descriptions - users

Complete summaries of user responses to both the pharmacy and telephone follow-up interview questions are reported in Appendix 3, which highlights modal and ranked responses, broken down for both the full (n=1185) and follow-up samples (n=718).

Key characteristics of the full study sample (n=1185)

Tables 3.2 – 3.8 highlight the key characteristics of the full sample, grouped according to variables potentially relating to users' choice of route to access the P medicine, collected within sections E and F of the pharmacy questionnaire. The key sample features are summarised below.

Demographic characteristics

The demographic breakdown of users included a 2:1 female to male ratio in the sample, which was almost exclusively white. There is a fairly even spread across the age bands, although there are fewer users in the 16-19 years age group. However, this is the case in other pharmacy practice research studies (Hassell et al., 1996, 1997, 1998; Tully & Temple, 1999). There was a good mix of different marital status groups in the sample, with just over half the sample married or co-habiting.

TABLE 3.2: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS
(CHI-SQUARE TEST COMPARING FULL AND FOLLOW-UP SAMPLES)

Variable	Full Sample n=1185 n (%)	Follow-up Sample n=718 n (%)	No Follow-up Sample n=467 n (%)	d.f.	X^2	p value
	%	%	%			
Sex						
Male	440 (37)	266 (37)	173 (37)	1	0.02	0.880
Female	745 (63)	452 (63)	294 (63)			
Ethnic Group						
White	1171 (99)	704 (98)	462 (99)	5	3.42	0.634
Non white	14 (1)	14 (2)	5 (1)			
Age Band						
< 16 years	150 (13)	101 (14)	51 (11)	7	4.31	0.743
16-19	29 (2)	14 (2)	14 (3)			
20-29	123 (10)	72 (10)	47 (10)			
30-39	188 (16)	115 (16)	73 (16)			
40-49	175 (15)	108 (15)	70 (15)			
50-59	169 (15)	108 (15)	61 (13)			
60-69	181 (15)	108 (15)	75 (16)			
70+	170 (14)	93 (13)	75 (16)			
Marital Status						
Married	581 (49)	359 (50)	219 (47)	6	6.52	0.367
Living with partner	35 (30	22 (3)	14 (3)			
Widowed	116 (10)	65 (9)	56 (12)			
Divorced	72 (6)	36 (5)	33 (7)			
Separated	22 (2)	14 (2)	9 (2)			
Single, never married	216 (18)	129 (18)	84 (18)			
N/A child	143 (12)	93 (13)	51 (11)			

Socio-economic characteristics

The full sample comprised 2:1 homeowners to renters. More than two-thirds of the sample had access to a car or van. Two-fifths of the sample was in paid work and three-fifths were not. Just over a quarter of the sample were retired. Over two-thirds of the users had completed their full-time education at less than 18 years and one sixth each of the sample were either still in full-time education or completed their full-time education at over 18 years. The sample included a good mix of deprivation category areas; with a third of the sample residing in areas classed as affluent, two-fifths in average, and a quarter in deprived areas.

TABLE 3.3: SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS
(CHI-SQUARE TEST COMPARING FULL AND FOLLOW-UP SAMPLES)

Variable	Full Sample (n=1185)	Follow-up Sample (n=718)	No Follow-up Sample (n=467)	d.f.	X^2	p value
	%	%	%			
Accommodation						
With Mtg/Loan	479 (41)	294 (41)	182 (39)	8	25.52	0.001
Owned outright	301 (25)	208 (29)	93 (20)			
Local authority	244 (21)	122 (17)	126 (27)			
Housing assoc.	70 (6)	36 (5)	33 (7)			
Private, unfurn.	40 (2)	14 (2)	9 (2)			
Private, furn.	20 (3)	29 (4)	14 (3)			
From employer	5 (0)	0 (0)	0 (0)			
Other, paid	10 (1)	7 (1)	5 (1)			
Other, rent free	12 (1)	7 (1)	5 (1)			
Deprivation Category						
Affluent	320 (27)	194 (27)	126 (27)	6	9.92	0.128
Average	652 (55)	388 (54)	266 (57)			
Deprived	213 (18)	136 (19)	75 (16)			
Access to a Car or Van						
Yes	843 (71)	546 (76)	299 (64)	1	17.53	0.000
No	342 (29)	172 (24)	168 (36)			
Employment Category						
Paid work f/t	378 (32)	230 (32)	149 (32)	8	7.00	0.536
Paid work p/t	112 (9)	72 (10)	42 (9)			
Gvmt. scheme	1 (0)	0 (0)	0 (0)			
Retired	329 (28)	194 (27)	135 (29)			
Unemployed	44 (4)	22 (3)	19 (4)			
Disabled/sick	52 (4)	36 (5)	14 (3)			
Caring for home	66 (6)	36 (5)	28 (6)			
In f/t education	124 (10)	79 (11)	47 (10)			
Something else	79 (7)	50 (7)	33 (7)			
Age Completed Full-Time Education						
Still in f/t education	190 (16)	122 (17)	75 (16)	2	25.56	0.000
< 18 years	805 (68)	460 (64)	336 (72)			
> 18 years	190 (16)	136 (19)	56 (12)			

Self-reported health status

Three-quarters of the sample rated their health as either very good or good. A fifth rated their health as fair. Very few users considered their general health status to be bad or very bad. In contrast, a third of the sample considered that they suffered from a longstanding illness.

TABLE 3.4: SELF-REPORTED HEALTH STATUS
(CHI-SQUARE TEST COMPARING FULL AND FOLLOW-UP SAMPLES)

Variable	Full Sample (n=1185)	Follow-up Sample (n=718)	No Follow-up Sample (n=467)	d.f.	X^2	p value
	%	%	%			
General Health Status						
Very good	290 (25)	180 (25)	112 (24)	4	10.55	0.032
Good	595 (50)	381 (53)	215 (46)			
Fair	253 (21)	136 (19)	117 (25)			
Bad	36 (3)	14 (2)	19 (4)			
Very bad	11 (1)	7 (1)	5 (1)			
Longstanding Illness						
Yes	435 (37)	273 (38)	168 (36)	1	0.50	0.480
No	749 (63)	445 (62)	299 (64)			

Use of general practice and community pharmacy services

Overall, there was a mix of consultation rates with both general practitioners and community pharmacists; broadly matching those identified in large, representative, national surveys (Carr-Hill, Rice & Roland, 1996; Tully & Temple, 1999). One in ten users had not seen their general practitioner at all in the previous year; two-fifths had only visited the general practitioner once or twice; and two-thirds had consulted the general practitioner between one and five times. A fifth (17%) of the users had not consulted the community pharmacist at all in the last year; compared to between 6-20% reported in other survey findings (Tully & Temple, 1999; Rogers, Hassell & Nicolaas, 1999). A quarter of users had consulted a community pharmacist only once or twice; and two-thirds had visited the community pharmacy between one and five times.

Over four-fifths of the sample had used the same community pharmacist regularly and there was almost a 50:50 split in the sample between those receiving a regular prescription medicine or not.

TABLE 3.5: USE OF GENERAL PRACTICE AND COMMUNITY PHARMACY SERVICES
(CHI-SQUARE TEST COMPARING FULL AND FOLLOW-UP SAMPLES)

Variable	Full Sample (n=1185)	Follow-up Sample (n=718)	No Follow-up Sample (n=467)	d.f.	X^2	p value
	%	%	%			
Number of General Practitioner Consultations Last Year						
0	118 (10)	86 (12)	42 (9)	4	6.06	0.194
1-2	498 (42)	287 (40)	205 (44)			
3-5	296 (25)	172 (24)	126 (27)			
6-10	190 (16)	122 (17)	65 (14)			
>10	83 (7)	50 (7)	28 (6)			
Number of Community Pharmacist Consultations Last Year						
0	261 (22)	122 (17)	145 (31)	4	50.31	0.000
1-2	320 (27)	172 (24)	145 (31)			
3-5	438 (37)	309 (43)	126 (27)			
6-10	154 (13)	100 (14)	47 (10)			
>10	12 (1)	14 (2)	5 (1)			
Use Same Community Pharmacist Regularly						
Yes	1022 (86)	617 (86)	406 (87)	1	0.18	0.675
No	163 (14)	100 (14)	61 (13)			
Regular Rx Medicine(s)						
Yes	571 (48)	359 (50)	210 (45)	1	3.15	0.076
No	614 (52)	359 (50)	257 (55)			

Access to general practitioner and community pharmacy services

User access to both general practice and community pharmacy services was fair. Ninety percent of the sample could usually see a general practitioner within a week and seventy percent within five days. This again broadly matches UK trends which indicate that a quarter of people wait more than five days to see a general practitioner (Leech, 2002). The vast majority of the sample lived within 2 miles of their general practice surgery and the community pharmacy that they used most often.

TABLE 3.6: ACCESS TO GENERAL PRACTICE AND COMMUNITY PHARMACY SERVICES
(CHI-SQUARE TEST COMPARING FULL AND FOLLOW-UP SAMPLES)

Variable	Full Sample (n=1185)	Follow-up Sample (n=718)	No Follow-up Sample (n=467)	d.f.	X^2	p value
	%	%	%			
Usual Wait to See General Practitioner						
Same day	237 (20)	136 (19)	98 (21)	6	12.92	0.044
Next day	178 (15)	101 (14)	70 (15)			
2 days	201 (17)	136 (19)	65 (14)			
3-5 days	237 (20)	151 (21)	84 (18)			
> 5 days	332 (28)	194 (27)	149 (32)			
Distance to General Practice Surgery						
< a mile	545 (46)	330 (46)	205 (44)	4	5.43	0.246
1-2 miles	509 (43)	302 (42)	205 (44)			
3-4 miles	95 (8)	50 (7)	42 (9)			
5 or more miles	36 (3)	36 (5)	14 (3)			
Distance to Community Pharmacy						
< a mile	758 (64)	452 (63)	308 (66)	4	1.96	0.742
1-2 miles	344 (29)	215 (30)	126 (27)			
3-4 miles	59 (5)	36 (5)	23 (5)			
5 or more miles	24 (2)	14 (2)	9 (2)			

Cost of medicines

Two-fifths of the sample paid for prescription charges and three-fifths did not. One in six users reported having been put off obtaining a medicine because of the cost at some time in the past. This confirms previous research evidence that indicates that medicine use is price sensitive (Leibowitz, Manning & Newhouse, 1985; Birch, 1986; O'Brien, 1989; Ryan & Birch, 1991; Huttin, 1994; Hughes & McGuire, 1995; Gerdtham & Johannesson, 1996; Lundberg et al., 1998; Eversley & Sheppard, 1998; Joyce, Escarce & Solomon, 2002);that not all prescriptions that are written are dispensed (OHE, 2001); and that the costs of over-the-counter medicines are prohibitive for some (Hassell et al., 1997; Rogers, Hassell & Nicolass, 1999).

TABLE 3.7: COST OF MEDICINES
(CHI-SQUARE TEST COMPARING FULL AND FOLLOW-UP SAMPLES)

Variable	Full Sample (n=1185)	Follow-up Sample (n=718)	No Follow-up Sample (n=467)	d.f.	X^2	p value
	%	%	%			
Exempt from Rx Charge						
Yes	675 (57)	416 (58)	271 (58)	1	0.04	0.838
No	510 (43)	302 (42)	196 (42)			
Put Off by Cost of Medicines						
Yes	190 (16)	86 (12)	98 (21)	1	15.49	0.000
No	995 (84)	632 (88)	369 (79)			

Types of medicines

Two-fifths of the medicines obtained by users in the sample were deregulated medicines; i.e. they had been reclassified from prescription only status (POM) to pharmacy available (P) under the supervised sale of a pharmacist. Three-fifths of the medicines obtained by the users in the sample were ordinary P class medicines. Two-fifths of the medicines obtained by users were included on the NHS blacklist of products (i.e. those which health professionals are not technically permitted to write prescriptions for).

TABLE 3.8: TYPE OF MEDICINES
(CHI-SQUARE TEST COMPARING FULL AND FOLLOW-UP SAMPLES)

Variable	Full Sample (n=1185)	Follow-up Sample (n=718)	No Follow-up Sample (n=467)	d.f.	X^2	p value
	%	%	%			
Deregulated (POM to P)						
Yes	492 (42)	294 (41)	196 (42)	1	0.04	0.838
No	693 (58)	424 (59)	271 (58)			
NHS Blacklisted						
Yes	513 (43)	302 (42)	215 (46)	1	2.21	0.137
No	672 (57)	416 (58)	252 (54)			

Inter-sample characteristics

In order to assess the representativeness of the study sample, it was compared to the results of other surveys within the research literature investigating utilisation patterns within general practice and community pharmacy nationally (Carr-Hill, Rice & Roland, 1996; Tully & Temple, 1999; Rogers, Hassell & Nicolaas, 1999; OHE, 2001; Scottish Executive, 2003). In addition, standard socio-economic and general health questions were borrowed from national surveys to compare the key characteristics of the study sample responders with both local and national data sources (ONS, 1998a-d). In particular, the study sample was compared with the broader Lothian Health population according to age, gender, deprivation categories, and use of prescription medicines and self-reported general health status (Scottish Office, 1998; Lothian Health, 1996a; Scottish Office, 1997a). These comparisons are outlined in table 3.9.

TABLE 3.9: COMPARISON OF KEY SAMPLE CHARACTERISTICS – STUDY SAMPLE AND LOTHIAN HEALTH POPULATION

Variable	Lothian Region %	Sample % n=1185
Age (years)		
0-9	12	11
10-19	11	5
20-29	17	9
30-39	17	16
40-49	13	14
50-59	10	14
60-69	9	16
70-79	7	11
80+	4	4
Sex		
Male	49	37
Female	51	63
Deprivation category		
Affluent	32	27
Average	44	55
Deprived	24	18
Taking Regular Rx Medicines		
Overall	37	48
Men	42	50
Women	32	45
General Health Status		
Very good/good	77	75
Fair	18	21
Bad/very bad	5	4
Longstanding Illness		
Yes	35	37
No	65	63

Age

This table indicates that the study sample includes broadly similar proportions of users within the 0-9, 30-59 and 80+ years age groups. However, the study sample included a smaller proportion of users in the 10-29 years range (-14%) and a higher proportion of users in the 60-79 years age bands (+11%) compared to the Lothian Health area profile. However, the age profile within the study sample broadly approximates those found within other community pharmacy studies of representative populations reported in the literature (Hassell et al., 1996, 1997, 1998; Rogers, Hassell & Nicolaas, 1999; Tully & Temple, 1999).

Sex

The study sample contains 12% more women and fewer men compared to the Lothian Health area generally. Again, this would be expected as previous research indicates that women are more frequent users of community pharmacy services than men (Tully & Temple, 1999; Hassell et al., 1998; Rogers, Hassell & Nicolaas, 1999).

Deprivation categories

The study sample includes a broadly similar profile of users resident in deprivation categories similar to the Lothian Health breakdown overall; albeit with a slightly smaller proportion of sample users resident within affluent areas and deprived areas and a higher proportion resident within average deprivation areas.

Use of prescription medicines

Higher proportions of users within the study sample were receiving regular prescription medicines compared to the Lothian Health population generally. Again this was expected given that the recruitment point for the study was within community pharmacies. In both the study and Lothian Health sample, there was increasing use of prescription medicines with increasing age, with use increasing markedly in the over 40 years age groups.

General health status

Self-reported general health status was very similar between the two populations, with three-quarters in each reporting either very good or good health; a fifth

reporting fair health; and a very small proportion reporting either bad or very bad health. Likewise, very similar proportions of users reported the presence of longstanding illness in both populations (35% & 37%) and these were close to national reported figures (40%) (Carr-Hill, Rice & Roland, 1996). Differences by gender and longstanding illness were not reported.

Overall, the study sample was broadly similar to the Lothian Health population across key variables. Likewise, key community pharmacy and general practice utilisation and general health status figures were broadly comparable to those reported in larger, national surveys. Where differences were identified, they were intuitive and expected given the particular research questions and study design and setting.

Intra-sample characteristics: full and follow-up samples

Univariate Chi-square analyses of contingency tables were undertaken to investigate the similarities and/or differences between the full and follow-up samples. The aim of this was to ascertain if there were any statistically significant differences in user characteristics between those users who consented to take part in the telephone follow-up interview (n=718) and those users who did not (n=467). Another purpose of this exercise was to ascertain the extent to which results from the follow-up sample could be generalised to the full sample. This analysis again focused on the groups of variables anticipated to impact on users' choice of consultation route to access their P class medicine, collected in sections E and F of the pharmacy questionnaire. The results of this analysis are also outlined within tables 3.2 – 3.8 and are summarised below.

Demographic characteristics

The full and follow-up samples exhibited very similar demographic profiles. There were no statistically significant differences between the two samples in terms of sex, ethnicity, age or marital status. However, statistically significant differences did exist between users' accommodation type across the two samples ($p = 0.001$). Homeowners were more likely to consent to take part in the telephone follow-up interview.

Socio-economic characteristics

There were no statistically significant differences between those who elected to be followed-up, or not, in terms of employment status or the deprivation category within which they lived. However, users who agreed to be followed-up were more likely to have access to a car or van ($p = 0.000$) and to have completed their full-time education at over eighteen years ($p = 0.000$)

Self-reported health status

There were no differences in the two samples regarding proportions reporting the presence of a longstanding illness. However, users who agreed to be followed-up were more likely to report good to fair health compared to those who declined to participate in the telephone follow-up interview ($p = 0.032$).

Use of general practice and community pharmacy services

There were very few differences between the two samples in terms of use of general practice and community pharmacy services. Both groups exhibited similar patterns in use of general practice consultation in the previous year, use of the same pharmacist regularly and receipt of regular prescription medicines. However, users who agreed to be followed-up were significantly more likely to have consulted the community pharmacist more frequently in the previous year ($p = 0.000$).

Access to general practice and community pharmacy services

There were no statistically significant differences in user distances to access general practice and community pharmacy services. However, users who declined to be followed-up were significantly more likely to experience longer usual waits to see the general practitioner ($p = 0.044$).

Cost of medicines

There were no statistically significant differences between the two groups in terms of prescription exemption status. However, users who declined to be followed-up were significantly more likely to have reported being put off accessing medicines because of the cost at some point in the past ($p = 0.000$).

Type of medicines

There were no statistically significant differences regarding the types of medicines being accessed by users who did or did not consent to a follow-up interview, with very similar proportions of deregulated and blacklisted medicines included within each group.

In summary, the statistically significant differences identified between the users who participated in the telephone follow-up interviews compared to those who did not, suggest that users from higher socio-economic groups were more inclined to take part in the follow-up telephone interview.

3.2.2.3 Sample descriptions – medicines

P medicines accessed on prescription or over-the-counter?

Three-quarters of study participants bought their P medicine over-the-counter from a community pharmacy under supervised sale arrangements. A quarter obtained their P medicine on prescription from a general practitioner, with over two-fifths of these obtained through repeat prescription systems. Identical access patterns were found among the sub-samples of users who agreed and did not agree to take part in the telephone follow-up interview.

Classification of P medicines in the study sample

A total of 1273 P medicines are included in the full study sample (n=1185). Table 3.10 outlines the distribution of the medicines included in the study, according to their British National Formulary (BNF) classifications, and ranks their proportional contribution within the sample.

TABLE 3.10: SAMPLE MEDICINES CLASSIFIED AND RANKED ACCORDING TO BNF CLASSIFICATION

BNF Chapter	n	%	Rank
4: Central nervous	362	28	1
3: Respiratory	261	21	2
10: Musculoskeletal & joint diseases	154	12	3
13: Skin	125	10	4
1: Gastro-intestinal	119	9	5
12: Ear, nose & oropharynx	80	6	6
7: Obs./gynae. & urinary tract	53	4	7
2: Cardiovascular	44	4	8
11: Eye	42	3	9
9: Nutrition and blood	27	2	10
5: Infections	3	-	11
6: Endocrine system	3	-	12
8: Malignant disease immunosuppression	0	0	-
14: Immunological products	0	0	-
15: Anaesthesia	0	0	-
Total	**1273***	**99**	**N/A**

Note: * the total number of medicines in the sample exceeds the sample size as some users obtained more than one.

The modal classification is BNF chapter 4, which covers drugs for the treatment of the central nervous system. Just under half of the study medicines (49%) fall within the two BNF classifications central nervous system (BNF Chapter 4) and respiratory system (BNF Chapter 3). Four-fifths of the study medicines came under the five BNF classifications: central nervous system; respiratory system; muskuloskeletal and joint diseases; skin; and gastro-intestinal system (BNF Chapters 4, 3, 10, 13 and 1 respectively). The most common conditions that prescriptions are written for are those relating to respiratory tract, gastrointestinal tract and skin (Smith & Salkind, 1990). These ranked within the top five areas that P medicines were accessed for within the study (ranking 2nd, 5th and 4th respectively). Overall, the P medicines included in the sample covered a broad range of conditions and BNF classifications.

Types of P medicines

Table 3.11 highlights proportions of the various medicines included within the full and follow-up samples according to three different types: deregulated medicines which have been reclassified from prescription-only-medicines (POMs) to pharmacy available (P); regular pharmacy available P class medicines; and medicines included on the NHS blacklist of products, technically unavailable through the NHS prescription system.

TABLE 3.11: BREAKDOWN OF MEDICINE TYPES WITHIN THE FULL AND FOLLOW-UP SAMPLES

Type of Medicine	Full Sample % (n*)	Follow-Up Sample % (n*)
Deregulated (POM to P)	42 (498)	41 (294)
P class	58 (687)	59 (424)
Blacklisted	43 (510)	42 (302)

* Note: **n*** refers to the number of medicines and not users (some users accessed more than one P medicine).

There is an almost identical breakdown across the different types of medicines within both the full and follow-up samples. Two-fifths of the medicines obtained by users in the samples were deregulated; three-fifths were regular P class medicines; and two-fifths of the medicines obtained were included on the NHS blacklist of products.

Very similar proportions of deregulated and regular P class products were obtained by users, regardless of whether they were bought over-the-counter or obtained on prescription. There were, however, a much smaller proportion of blacklisted medicines obtained through prescription access routes (16% versus 43%). This was to be expected as general practitioners are technically prohibited from prescribing medicines included on the NHS blacklist.

3.3 Users' routes to access P medicines and the extent of substitution and complementary usage between general practice and community pharmacy services

Two other key objectives of this research were to describe the routes adopted by the sample of users to access P class medicines to treat a particular episode of illness; assessing the extent of substitution or complementary usage between general practice and community pharmacy services as a result.

For the sub-sample of users who participated in both the pharmacy and telephone follow-up interview surveys (n=718) it was possible to map their routes to access P medicines and assess the extent of substitution or complementary usage between the general practitioner and community pharmacist in doing so. These are outlined in table 3.12.

TABLE 3.12: USER ROUTES TO ACCESS P MEDICINES (N=718)

User Access Route		No. of Users N=718 (%)
First Visit	**Revisit**	
Community Pharmacy	None	418 (58)
General Practitioner	None	134 (19)
Community Pharmacy	General Practitioner	76 (11)
General Practitioner	General Practitioner	46 (6)
Community Pharmacy	Community Pharmacy	39 (5)
General Practitioner	Community Pharmacy	5 (1)

Just over three-quarters (N=552; 77%) of the users visited either the general practitioner or community pharmacist only, with no subsequent revisits, in the management of the illness episode that they accessed the P medicine for. One in four users (N=161; 23%) did, however, revisit the general practitioner or community pharmacist. Of those users adopting a pharmacy first route (N=533) to access their P medicine, one in five (N=115; 22%) followed that up with a general practitioner appointment. Among users opting to visit the general practitioner first (N=185) to obtain a prescription for the P medicine, over a quarter (N=51; 28%) revisited either the general practitioner or community pharmacist, although this was mainly the general practitioner.

The proportion of users re-visiting either the community pharmacist or general practitioner was considerably higher in this study (22% and 28% respectively) compared to those within the Care at the Chemist study (6% and 4% respectively) (Whittington et al., 2001). Further, much higher proportions of community pharmacy users who made a follow-up visit consulted a general practitioner for follow-up (14%) compared to within the Care at the Chemist study (2%) (Whittington et al., 2001). These findings are important as the higher proportion of revisits generally, alongside the higher proportion of revisits to general practitioners specifically, among users visiting community pharmacies to access P medicines, indicates that complementary usage was more and successful substitution between services less prevalent than previous research had indicated. This has potentially important implications for the costs and potential savings associated with policies encouraging increased self-medication in the management of minor ailments within primary care.

A quarter of participants used general practice and community pharmacy services in a complementary fashion, visiting both in the management of the particular episode of illness that they accessed the P medicine for. A sizeable proportion (22%) of users who elected to try the pharmacist first failed in their attempt to self-medicate, subsequently consulting a general practitioner. Overall though, the majority of users adopting a pharmacy first access route (78%) appeared able to substitute a P class

medicine, obtained over-the-counter from a community pharmacist, in place of a general practitioner consultation, in their attempt to self-medicate and manage a particular episode of illness. Exactly how this 'substitution' may be interpreted, however, is discussed fully in Chapter 6.

Finally, it should be noted that none of the findings outlined above rules out the possibility that some or all of both groups could have successfully managed their entire illness episode without either general practitioner or community pharmacist input.

3.4 User views on use of community pharmacies and increasing availability of P medicines

At the end of the telephone follow-up interview, participants (n=718) were asked two general questions regarding use of community pharmacies and increasing availability of P medicines. User responses to these questions were coded. The top ten responses to the two questions asked are summarised in table 3.13. A full summary of users' responses is included in table A3.1 in Appendix 3.

TABLE 3.13: TOP TEN USER RESPONSES TO OPEN QUESTIONS REGARDING USE OF COMMUNITY PHARMACIES

In what circumstances would you prefer to go to the pharmacist, rather than the GP?	
Reason	**n* (%)**
Try to use the community pharmacist when I can	240 (33)
For minor complaints	211 (29)
When I feel confident about self treating	142 (20)
I prefer to see the doctor, better, safer	95 (13)
I don't like to bother the doctor or waste their time	65 (9)
Pharmacists are highly trained/give good advice	61 (8)
Convenience	50 (7)
When I am familiar with the medicine	46 (6)
I don't like to go to the doctor	46 (6)
It is difficult to get an appointment with the GP	45 (6)
What do you think about making more medicines, which were in the past only available on prescription, available from the pharmacist to buy?	
Reason	**n* (%)**
More convenient	231 (33)
No need to wait to see the doctor	132 (18)
Cheaper over-the-counter	91 (13)
With monitoring and advice from the pharmacist	85 (12)
Risk of inappropriate, unnecessary or overuse of medicines	83 (12)
Relieves pressure on NHS/saves doctors' time	71 (10)
Dangers with strong medicines/safety issues	65 (9)
Better left in the control of doctors	61 (8)
Potential abuses could arise	61 (8)
Pharmacists are experts in medicines/give good advice	55 (8)

Note: **n*** refers to the number of responses and not users (respondents often gave multiple responses)

3.4.1 In what circumstances would you prefer to go to the pharmacist, rather than the GP?

A third of users noted that they prefer to use the pharmacist, as opposed to the general practitioner, whenever they could. Sizeable proportions also said that they preferred to use the community pharmacy for minor complaints, that they felt confident self-treating. However, just over a tenth of the users indicated that they would always prefer to visit a general practitioner.

3.4.2 What do you think about making more medicines, which were in the past only available on prescription, available from the pharmacist to buy?

Users' most common responses regarding increased availability of P class medicines from community pharmacies were that, it enhanced convenience, obviated the need to see a doctor and would be cheaper. However, a fifth of the users also expressed a number of potential concerns relating to inappropriate usage of medicines if more routinely available.

User responses to the open questions eliciting their views on use of community pharmacies and P medicines mirrored many of the advantages and disadvantages identified within the broader literature, previously summarised in section 1.3.5 in the literature review chapter (and table A1.3 in Appendix 1).

3.5 Summary of policy relevant results

BOX 3.1: SUMMARY OF POLICY RELEVANT RESULTS

- Over three-quarters of users visited either the general practitioner or community pharmacist only, with no revisit, indicating that one consultation was sufficient to support their use of a P class medicine.
- Approximately one-quarter of users did, however, revisit either the general practitioner or community pharmacist for further advice and/or treatment in their management of the same minor illness episode.
- One in five of the users who opted to access their P medicine direct from a community pharmacist, followed up that visit with a general practitioner consultation.
- Over a quarter of users who visited a general practitioner first to obtain their P medicine, followed-up that visit with another visit to either a general practitioner or a community pharmacist.
- The majority of users who adopted a community pharmacy first consultation route appeared able to substitute this for a consultation with a general practitioner to access a P class medicine.
- A third of users noted they would prefer to use the pharmacist as opposed to the doctor whenever they could.
- Users were most comfortable using the pharmacist, rather than the doctor, for minor complaints and when they felt confident self-treating.
- A tenth of users noted that they would always prefer to visit the doctor rather than the pharmacist.
- Users were generally positive about increasing availability of medicines from community pharmacies, noting it enhanced convenience, prevented having to see a doctor and felt it would be cheaper.
- A number of users did express potential concerns relating to inappropriate usage of medicines.

Chapter 4:

What predicts user choice to access P medicines from a general practitioner or community pharmacist?

4.1 Introduction

The next stage in the data analysis was to develop a model, to identify variables predictive of users' choice of route to access their P medicine. Univariate (chi-square analyses of categorical variables within contingency tables) and multivariate (logistic regression) statistical techniques were used to analyse the groups of variables hypothesised to impact on the users' route to access P medicines, once again including: demographic and socio-economic characteristics; self-reported health status; access to and use of general practitioner and community pharmacist services; and cost and type of medicines.

4.2 Univariate analyses

Chi-square analyses were used to investigate associations between users' route to access P medicines (general practitioner or community pharmacist) and variables of interest. The aim of this analysis was to ascertain if there were any statistically significant differences in characteristics between those users who opted to go to the community pharmacist to buy their P medicine over-the-counter, and those who obtained a P medicine on prescription from a general practitioner. The results of the univariate analysis are outlined in tables 4.1 - 4.7 and summarised below.

4.2.1 Demographic characteristics

The sex and ethnicity profile was almost identical between users accessing their P medicines from the general practitioner or community pharmacist. However, statistically significant differences did exist between the two groups regarding their age ($p < 0.001$) and marital status ($p < 0.001$). Users in the age range 30-59 years were more likely to visit the community pharmacist first, whereas those over 60 years of age were more likely to consult the general practitioner to access their P medicines. These findings concur with those identified by Payne et al., (1996) in their postal survey investigating users willingness to pay for medicines. Users accessing their P medicine from the community pharmacist were more likely to be married/co-habiting compared to those obtaining their P medicine on prescription. This trend has also been identified in previous surveys (Tully & Temple, 1999; Rogers, Hassell & Nicolaas, 1999).

TABLE 4.1: ASSOCIATIONS BETWEEN CHOICE OF ROUTE TO ACCESS P MEDICINES & DEMOGRAPHIC CHARACTERISTICS

(CHI-SQUARE TEST COMPARING GENERAL PRACTICE AND COMMUNITY PHARMACY USERS)

Variable	GP First n=303	CP First n=882	d.f.	X^2	p value
	n (%)	n (%)			
Sex					
Male	120 (40)	320 (36)	1	1.06	0.302
Female	183 (60)	562 (64)			
Ethnic Group					
White	299 (99)	872 (99)	1	0.06	0.796
Non-white	4 (1)	10 (1)			
Age Band					
< 16 years	43 (14)	107 (12)	7	63.41	0.000
16-19	9 (3)	20 (2)			
20-29	32 (11)	91 (10)			
30-39	29 (10)	159 (18)			
40-49	26 (9)	149 (17)			
50-59	28 (9)	141 (16)			
60-69	64 (21)	117 (13)			
70+	72 (24)	98 (11)			
Marital Status					
Married/living pt.	140 (46)	476 (54)	4	11.63	0.020
Widowed	40 (13)	76 (9)			
Divorced/separated	30 (10)	64 (8)			
Single	50 (17)	166 (19)			
N/A child	43 (14)	100 (10)			

4.2.2 Socio-economic characteristics

The break down of socio-economic characteristics between users accessing P medicines from the general practitioner or community pharmacist was markedly different. Statistically significant differences ($p < 0.001$) existed in terms of users: accommodation types; deprivation category of residence; access to a car or van; employment status; and the age at which they had completed full-time education. Users buying their P medicines over-the-counter were statistically significantly more likely to: be homeowners; live within affluent deprivation category areas; have access to a car or van; be in paid employment; and to have completed their full-time education at a later age (>18 years).

Conversely, users accessing P medicines on prescription from a general practitioner were statistically significantly more likely to live in rented accommodation; within more deprived areas; to have no access to a car or van; not to be in paid work; and to have completed full-time education at a younger age.

The findings regarding employment status, access to a vehicle and education were also identified in surveys reported by Tully and Temple (1999) and Rogers, Hassell and Nicolaas (1999).

TABLE 4.2: ASSOCIATIONS BETWEEN CHOICE OF ROUTE TO ACCESS P MEDICINES & SOCIO-ECONOMIC CHARACTERISTICS

(CHI-SQUARE TEST COMPARING GENERAL PRACTICE AND COMMUNITY PHARMACY USERS)

Variable	GP First n=303	CP First n=882	d.f.	X^2	p value
	n (%)	n (%)			
Accommodation					
With Mtg./Loan	64 (21)	415 (47)	8	100.01	0.000
Owned outright	78 (26)	223 (25)			
Local authority	107 (35)	137 (16)			
Housing assoc.	31 (10)	39 (4)			
Private, unfurn.	5 (2)	32 (2)			
Private, furnished	8 (3)	15 (4)			
From employer	1 (-)	4 (-)			
Other, paid	6 (2)	4 (1)			
Other, rent free	3 (1)	9 (1)			
Deprivation Category of Postcode in which User Lived					
Affluent	33 (12)	260 (32)	2	125.03	0.000
Average	135 (49)	455 (57)			
Deprived	24 (39)	9 (11)			
Access to a Car or Van					
Yes	169 (56)	674 (76)	1	46.80	0.000
No	134 (44)	208 (24)			
Employment Category					
In paid work	54 (18)	441 (50)	4	114.13	0.000
Retired	121 (40)	212 (24)			
Not in paid work	73 (24)	79 (9)			
In f/t education	39 (13)	88 (10)			
Something else	16 (5)	62 (7)			
Age Completed f/t Education					
Still in f/t education	55 (18)	141 (16)	2	21.38	0.000
< 18 years	224 (74)	573 (65)			
> 18 years	24 (8)	168 (19)			

4.2.3 Self-reported health status

Statistically significant differences existed between the two groups in terms of self-reported health status. Users who bought their P medicine over-the-counter at the community pharmacist were significantly more likely to report very good or good general health ($p < 0.001$) and less likely to report the presence of a longstanding illness ($p < 0.001$) compared to users who accessed their P medicine on prescription from a general practitioner. This finding is interesting as associations between existence of a longstanding illness and propensity to purchase P medicines over-the-counter is not specifically identified within the literature.

TABLE 4.3: ASSOCIATIONS BETWEEN CHOICE OF ROUTE TO ACCESS P MEDICINES & SELF-REPORTED HEALTH STATUS
(CHI-SQUARE TEST COMPARING GENERAL PRACTICE AND COMMUNITY PHARMACY USERS)

Variable	GP First n=303	CP First n=882	d.f.	X^2	p value
	n (%)	n (%)			
General Health Status					
Very good/good	173 (57)	712 (81)	2	74.32	0.000
Fair	102 (34)	151 (17)			
Bad/very bad	28 (9)	19 (2)			
Longstanding Illness					
Yes	182 (60)	255 (29)	1	93.579	0.000
No	121 (40)	627 (71)			

4.2.4 Use of general practice and community pharmacy services

Users accessing P medicines from the community pharmacist were, generally, less frequent users of general practitioner and community pharmacist services. They were significantly less likely to have seen the general practitioner as often in the last year; be receiving regular prescription medicines; or using the same pharmacist regularly. They were, however, more likely to have consulted the community pharmacist more frequently in the last year. These findings corroborate those identified by Payne et al., (1996) in their postal survey investigating user willingness to pay for medicines.

TABLE 4.4: ASSOCIATIONS BETWEEN CHOICE OF ROUTE TO ACCESS P MEDICINES & USE OF GENERAL PRACTICE & COMMUNITY PHARMACY SERVICES
(CHI-SQUARE TEST COMPARING GENERAL PRACTICE AND COMMUNITY PHARMACY USERS)

Variable	GP First n=303	CP First n=882	d.f.	X^2	p value
	n (%)	n (%)			
Number of General Practitioner Consultations in the Last Year					
0	4 (1)	123 (14)	4	143.70	0.000
1-2	84 (28)	406 (46)			
3-5	84 (28)	212 (24)			
6-10	79 (26)	114 (13)			
>10	52 (17)	27 (3)			
Number of Community Pharmacy Consultation in the Last Year					
Not at all	138 (46)	125 (14)	2	131.60	0.000
Up to 5 times	147 (48)	610 (69)			
> 5 times	18 (6)	147 (16)			
Use Same Community Pharmacy regularly					
Yes	290 (96)	732 (83)	1	30.08	0.000
No	13 (4)	150 (17)			
Receive Regular Prescription Medicines					
Yes	225 (74)	344 (39)	1	110.19	0.000
No	78 (26)	538 (61)			

4.2.5 Access to general practitioner and community pharmacy services

There were no differences between the two groups of users regarding usual wait to see a general practitioner ($p = 0.305$) or in distance to their local pharmacy ($p = 0.081$). The absence of an association between usual waiting times to see general practitioners and accessing P medicines from community pharmacies is interesting, given that user frustration with primary care waiting times has routinely been identified as a key rationale underpinning policy initiatives to enhance and graduate access to primary care services generally and make more use of community pharmacies specifically.

Users accessing their P medicine from the community pharmacist were significantly more likely to live a greater distance from their general practitioner surgery. This finding seems to support evidence in the literature that indicates that distance from services is generally predictive of utilisation rates, with an inverse relationship between distance to facilities and utilisation (Campbell & Roland, 1996; Hopton, Howie & Porter, 1992).

TABLE 4.5: ASSOCIATIONS BETWEEN CHOICE OF ROUTE TO ACCESS P MEDICINES & ACCESS TO GENERAL PRACTICE & COMMUNITY PHARMACY SERVICES
(CHI-SQUARE TEST COMPARING GENERAL PRACTICE AND COMMUNITY PHARMACY USERS)

Variable	GP First n=303	CP First n=882	d.f.	X^2	P value
	n (%)	n (%)			
Usual Wait to See General Practitioner					
< a week	288 (91)	826 (93)	1	1.05	0.305
> a week	25 (9)	56 (7)			
Distance to General Practice Surgery					
< 2 miles	280 (92)	776 (87)	1	4.65	0.031
> 2 miles	23 (8)	106 (13)			
Distance to Community Pharmacy					
< 2 miles	288 (95)	811 (92)	1	3.052	0.081
> 2 miles	15 (5)	71 (8)			

4.2.6 Costs of medicines

Users accessing their P medicines on prescription from the general practitioner were significantly more likely ($p < 0.001$) to be exempt from paying prescription charges (an association also identified by Payne et al., 1996) and significantly less likely to report ever having been put off obtaining medicines because of their cost.

TABLE 4.6: ASSOCIATIONS BETWEEN CHOICE OF ROUTE TO ACCESS P MEDICINES & COST OF MEDICINES
(CHI-SQUARE TEST COMPARING GENERAL PRACTICE AND COMMUNITY PHARMACY USERS)

Variable	GP First n=303	CP First n=882	d.f.	X^2	p value
	n (%)	n (%)			
Exempt from Rx Charge					
Yes	274 (90)	406 (46)	1	181.33	0.000
No	29 (10)	476 (54)			
Put Off by Cost of Medicines					
Yes	86 (28)	101 (12)	1	48.64	0.000
No	217 (72)	781 (88)			

4.2.7 Types of medicines

There were no statistically significant differences between the proportions of users obtaining deregulated medicines between the two groups (p = 0.358). However, users electing to buy their P medicine over-the-counter from the community pharmacist were statistically significantly more likely to be obtaining a medicine included within the list of NHS blacklisted products.

TABLE 4.7: ASSOCIATIONS BETWEEN CHOICE OF ROUTE TO ACCESS P MEDICINES & TYPE OF MEDICINES
(CHI-SQUARE TEST COMPARING GENERAL PRACTICE AND COMMUNITY PHARMACY USERS)

Variable	GP First n=303	CP First n=882	d.f.	X^2	p value
	N (%)	n (%)			
Deregulated (POM-to-P)					
Yes	119 (39)	373 (42)	1	0.84	0.358
No	184 (61)	509 (58)			
NHS Blacklisted					
Yes	47 (15)	466 (53)	1	127.96	0.000
No	256 (85)	416 (47)			

4.3 Multivariate analysis

Seventeen of the 22 variables investigated to see if they might be predictive of users' choice to access P medicines from either the general practitioner or community pharmacist exhibited statistically significant associations in the univariate analyses.

However, a problem with the univariate approach is that it ignores the possibility that a collection of variables, each of which is weakly associated with the outcome, can become an important predictor of outcome when taken together (Hosmer & Lemeshow, 1989). For this reason, it is also desirable to try to take account of the relationships between the predictor variables in order to determine their relative influence on users' route to access their P medicine. It could be that only a small number of the predictor variables influence the choice of access route adopted by the user and that other variables exhibit statistically significant univariate relationships as a result of association with the key predictor variables. Alternately, it may be that each variable has an independent effect upon users' choice of method to access their P medicine. A logistic regression model was developed to explore these issues.

4.3.1 Logistic regression modelling

Multivariate logistic regression analyses were undertaken. It was conducted using SPSS version 9. The dependent variable was the binary outcome variable general practitioner or community pharmacist route to access P medicines (drph1st). The regression model was organised to predict users electing to obtain their P medicine over-the-counter from a community pharmacist. Independent variables entered into the regression analysis were the groups of demographic, socio-economic, health status, use of and access to general practitioner and community pharmacist services and cost and type of medicines variables collected. These are summarised in table 4.8.

TABLE 4.8: VARIABLES ENTERED INTO THE LOGISTIC REGRESSION ANALYSIS

DEPENDENT VARIABLE	
GP or CP route to access P medicine	Drph1st
INDEPENDENT VARIABLES	
Community Pharmacy variables	
Community pharmacy	Phcode*
Chain or independent	Chainind*
Demographic Characteristics	
Sex	F1sex*
Ethnicity	F2summ*
Age	F3age
Marital Status	F4mstat2*
Socio-economic Characteristics	
Accommodation type	F5summ*
Postcode	F6summ*
Access to a car or van	F7carvan*
Employment status	F8summ*
Age completed f/t education	F9fted*
Self-reported General Health Status	
Self-reported general health status	E12genht
Any longstanding illness	E13lgill*
Use of General Practice and Community Pharmacy Services	
No. of GP consultations in the last year	E1yrnogp
No. of CP consultations in the last year	E4yrnoph
Use the same CP regularly	E5same ph*
In receipt of regular Rx	E7regrx*
Access to General Practice and Community Pharmacy Services	
Usual waiting time for a GP apptmt.	E2uswtgp
Distance to GP surgery from home	E3fargp
Distance to CP from home	E6farph
Cost of Medicines	
Prescription exemption status	E8payrx*
Put off obtaining medicines due to cost	E11ctoff*
OTC price relative to the Rx fee	Prelrx*
Type of Medicines	
Recently deregulated P medicine	G6pomtop*
Medicine on NHS blacklist	G7blackl*
Interaction Terms	
In receipt of regular Rx and accommodation type	E7regrx by f5summ
Use same CP regularly and Rx exemption status	E5sameph by e8payrx
Use same CP regularly and recently deregulated medicine	E5sameph by g6pomtop

* indicates that the variable was entered as a categorical variable

A forward stepwise procedure was selected with the criterion for entry into the model based on the likelihood ratio (LR) statistic, based on maximum likelihood estimates. This involves estimating the model with each variable added in turn and looking at the change in results in the test statistic. The model solution is derived iteratively by beginning with a tentative solution, revising it slightly to see if it can be improved and repeating the process until the change in the likelihood function from one step to another is non-significant (Menard,1995). At any step, the most important variable will be the one that produces the greatest change in the log likelihood relative to the model not containing the variable (Hosmer & Lemeshow, 1989). The likelihood ratio (LR test) was chosen as the test statistic, as it is believed to be superior to other approaches, as the model is calculated with and without the variable being tested. It takes longer to compute but it is more accurate (Menard, 1995).

All variables were entered in one block and coded using the default deviation contrasts system, whereby each category of the predictor variable is compared to the overall effect (Norusis, 1993). The default entry (0.05) and removal criteria (0.1) for variables were selected; i.e. at each step, variables with the smallest significance level for the score statistic (the LR test) are entered into the model, provided it is less than 0.05; and variables with the largest significance levels are removed from the model, provided they exceed 0.1.

A number of statistics and plots were requested to assess the goodness of fit of the model, including: classification plots (with the default cut off set at 0.75); the Hosmer-Lemeshow goodness of fit statistic; and histograms of observed and expected probabilities. A number of measures of influence were requested including, Cook's distance and leverage values. Finally, key residual variables were generated including, studentised, standardised and deviance.

A complete set of the logistic regression calculations, at the final step of the analysis is included in Appendix 4. Key variables and their interpretation are summarised next.

4.4 Logistic regression results

A total of 1074 cases were initially included within the logistic regression model. 111 cases were initially rejected from the analysis because of missing data. These 111 excluded cases arise because postcode data was missing, making it impossible to attribute the postcode (f6depcat) variable to them. However, using small area Lothian Health statistics, it was possible to impute a postcode and thus deprivation variable, as the catchment areas of the community pharmacies were relatively small (Lothian Health, Information Officer, Personal Communication, 1999). Thus, all 1185 cases were, ultimately, included in the logistic regression analysis.

Table 4.9 summarises the final output equation and indicates that 11 of the 28 variables entered into the logistic regression were independently associated with the outcome variable; i.e. were predictors of users' choice of route via which to access P medicines.

TABLE 4.9: ASSOCIATIONS BETWEEN USERS' ACCESSING P MEDICINES FROM COMMUNITY PHARMACIES & VARIABLES WITHIN THE FINAL LOGISTIC REGRESSION MODEL

Variable	B	SE	Exp (B) OR	95% CI for Exp (B)		Significance
				Lower	Upper	
Pharmacy						
Pharmacy 7	-1.45	0.71	0.23	0.57	0.94	0.04
Pharmacy 13	-2.05	0.99	0.12	0.01	0.90	0.03
Demographic Characteristics						
Single, never married	0.52	0.23	1.69	1.07	2.68	0.02
Child	-0.66	0.29	0.51	0.28	0.92	0.02
Socio-economic Characteristics						
Deprived depcat	-0.74	0.28	0.47	0.27	0.82	0.00
Self-reported General Health Status						
Have a longstanding illness	-0.27	0.12	0.75	0.58	0.98	0.03
Use of General Practice and Community Pharmacy Service						
No. of GP visits in last year	-0.28	0.10	0.75	0.61	0.91	0.00
No. of CP visits in last year	0.67	0.14	1.96	1.49	2.59	0.00
Use the same CP regularly	-0.57	0.19	0.56	0.38	0.83	0.00
Receive regular Rx meds.	-0.44	0.14	0.64	0.48	0.84	0.00
Cost of Medicines						
Pay for Rx	0.52	0.20	1.69	1.14	2.51	0.00
Pay for Rx & use same CP regularly	0.48	0.19	1.61	1.11	2.35	0.01
Type of Medicine						
Blacklisted	1.09	0.12	3.00	2.34	3.84	0.00

As with standard linear regression coefficients, the logistic regression coefficients can be interpreted as the change in the dependent variable associated with a one-unit change in the independent variable (Menard, 1995). The results of the model indicate that the odds of users accessing their P medicine over-the-counter from a community pharmacist decrease significantly: within certain pharmacies; if the P medicine was for a child (OR = 0.51); if the user lived in an area classed as deprived (OR = 0.47); if the user reported the presence of a longstanding illness (OR = 0.78); the more often users consulted with their general practitioner in the last year (OR = 0.75); if they had used the same community pharmacist regularly (OR = 0.56); and if they received regular prescription medicines (OR = 0.64).

Conversely, the results of the model indicate that the odds of users accessing their P medicine over-the-counter from a community pharmacist increase significantly: if the user is single (OR = 1.69); the more often the user consulted with a community pharmacist in the last year (OR = 1.96); if the user was eligible to pay for prescription medicines (OR = 1.69); if they pay for prescriptions and use the same pharmacist regularly (OR = 1.61); and if they were obtaining a medicine included on the NHS blacklist (OR = 3.00).

4.4.1 Comment on what stays in and drops out of the regression model

4.4.1.1 Variables remaining in the logistic regression model

Demographic characteristics

The only demographic variable to remain in the logistic regression model was marital status. Single users were almost twice as likely (OR = 1.69) to choose to access their P medicine over-the-counter at the community pharmacy. Interestingly, this result changes from the univariate analysis and contradicts literature evidence suggesting that those who are married/co-habiting are more likely to purchase over-the-counter medicines (Tully & Temple, 1999; Rogers, Hasssell & Nicolaas, 1999).

Socio-economic characteristics

The deprivation category within which users lived was the only statistically significant socio-economic predictor variable left in the regression model. Users resident in deprived areas were almost two times less likely (OR = 1.60) to choose to buy their P medicine over-the-counter from the community pharmacy. This finding reinforces other research evidence that indicate that affordability of medicines may be problematic among users in less advantaged situations (Hassell et al., 1997; Rogers, Hassell & Nicolaas, 1999). Again, however, in the absence of a direct income variable, caution should be urged in interpreting the socio-economic variables given their ecological nature.

Self-reported health status

Illness burden appears to be an important predictor. The odds of users who reported the presence of a longstanding illness buying their P medicine over-the-counter decreased significantly, by a factor of two (OR = 2.13). The fact that this variable remains in the model is interesting as, while there is evidence of association between use of medicines generally and health status (i.e. those who are most ill, use most medicines) the existence of an inverse relationship between presence of self-reported longstanding illness and utilisation of over-the-counter medicines specifically was not identified within the literature.

Use of general practice and community pharmacy services

All variables relating to use of general practitioner and community pharmacy services remained in the model. The more often users consulted their general practitioner in the last year; receipt of regular prescription medicines; and use of the same pharmacist regularly all decreased the probability of users accessing their P medicine from the community pharmacist, again by nearly a factor of two. Conversely, users who reported more frequently consulting the community pharmacist in the last year were twice as likely to have visited a community pharmacy to obtain their P medicine. These results may indicate that habit and/or illness burden could be important predictors.

Cost of medicines

The cost of medicines to users also appears to be an important predictor. Users who were not exempt from prescription charges were almost twice as likely to buy their P medicine over-the-counter from a community pharmacist. This finding concurs with the general weight of evidence regarding the existence of negative and inelastic price elasticities for the demand of medicines generally and their affordability among less affluent users specifically.

Type of medicine

The blacklist status of medicines seems influential. Users obtaining a P medicine included on the NHS blacklist (Scottish Pharmaceutical General Council, 1997) were three times more likely to buy it over-the-counter from the community pharmacist. This may suggest that users are very product specific, or again that habits are important.

Pharmacy

The community pharmacy variable remained in the model and was highly significant overall. This suggests that there is something about the community pharmacies that predicts user choice of whether to access P medicines from the general practitioner or community pharmacy, even among people with the same individual level characteristics. This may be a characteristic of the community pharmacies themselves, features of the area they are located within, or perhaps linked to the

general practices that they are closely associated with. More sophisticated statistical analyses would be required to investigate this further, such asf multi-level-modelling techniques (Carr-Hill, Rice & Roland, 1996). This was considered, however, on the advice of a statistician, it was deemed to be methodologically difficult with only 15 pharmacies (Nigel Rice, personal communication, 1999). Exploring the relevance of community pharmacy level variables is an important area for further research to inform policy.

4.4.2 Variables dropping out of the logistic regression model

Table 4.10 highlights the non-significant variables not included within the final logistic regression model. None of these variables was marginal, or even approaching significance. For a full report of the variables not included in the final regression equation, see table A4.1 in Appendix 4.

TABLE 4.10: VARIABLES DROPPING OUT OF THE LOGISTIC REGRESSION MODEL

Community Pharmacy variables	
Chain or independent	Chainind*
Demographic Characteristics	
Sex	F1sex*
Ethnicity	F2summ*
Age	F3age
Socio-economic Characteristics	
Accommodation type	F5summ*
Access to a car or van	F7carvan*
Employment status	F8summ*
Age completed f/t education	F9fted*
Self-reported Health Status	
Self-reported general health status	E12genht
Access to General Practice and Community Pharmacy Services	
Usual waiting time for a GP apptmt.	E2uswtgp
Distance to GP surgery from home	E3fargp
Distance to CP from home	E6farph
Cost of Medicines	
Put off obtaining medicines due to cost	E11ctoff*
OTC price relative to the Rx fee	Prelrx*
Type of Medicines	
Recently deregulated P medicine	G6pomtop*
Interaction Terms	
Receiver regular Rx & accommodation	E7regrx by f5summ
Use same CP regularly & deregulated medicine	E5sameph by g6pomtop

There were a couple of contrary findings regarding variables that were not included in the final model. In particular, a key policy rationale for encouraging increased self-medication, particularly using recently deregulated medicines, is that it would reduce the wait, or indeed obviate the need, to consult a general practitioner. Usual waiting time to get general practitioner appointment might have been expected to be predictive of the decision by users to access P medicines from the community pharmacist, buying them direct, over-the-counter. However, this variable was not a significant predictor in either the univariate or multivariate analyses.

General health status did not predict users' choice of consultation route to access P medicines. This variable exhibited a statistically significant association within the univariate analyses but dropped out of the logistic regression model. This may have been due to the fact that it did not appear to be a very sensitive variable, with very

few users reporting bad or very bad health. Alternately, this variable may have been strongly correlated with the longstanding illness variable that did remain in the multivariate model.

An age effect might also have been expected but did not emerge. Similarly, the price paid by the user for his/her medicine relative to the prescription fee, might have been anticipated to be included in the model, yet was not. However, it may be that the prescription exemption status variable was measuring similar features to these two variables, given that both age and cost considerations are implicit to this variable.

4.5 Extent of convergence between the univariate and multivariate analyses

Table 4.11 summarises the significance, or otherwise, of key variables in both the univariate and multivariate analysis, highlighting the changing significance status of variables between the two steps. Variables that were statistically significant in the univariate but not the multivariate analyses are highlighted in bold.

TABLE 4.11: CHANGING SIGNIFICANCE OF VARIABLES BETWEEN UNIVARIATE & MULTIVARIATE ANALYSES (Y=YES; N=NO)

Variable	Significant in Univariate Analysis?	Significant in Multivariate Analysis?
Demographic Characteristics		
Sex	N	N
Ethnicity	N	N
Age	Y	N
Marital Status	Y	Y
Socio-economic Characteristics		
Accommodation type	Y	N
Postcode	Y	Y
Access to a car or van	Y	N
Employment status	Y	N
Age completed f/t education	Y	N
Self-reported General Health Status		
Self-reported health status	Y	N
Any longstanding illness	Y	Y
Use of General Practice and Community Pharmacy Services		
No. of GP visits in last year	Y	Y
No. of CP visits in last year	Y	Y
Use the same CP regularly	Y	Y
In receipt of regular Rx	Y	Y
Access to General Practice and Community Pharmacy Services		
Usual wait for a GP apptmt.	N	N
Distance to GP surgery	Y	N
Distance to CP	N	N
Cost of Medicines		
Exempt from Rx fee	Y	Y
Cost put-off obtaining med.	Y	N
Type of Medicines		
Deregulated P medicine	N	N
Blacklisted medicine	Y	Y

Eight variables were statistically significant within the univariate analysis which subsequently lost their significance and dropped out of the multivariate logistic

regression model, including: age; type of accommodation; access to a car or van; employment category; age completed full-time education; general health status; distance to the general practice surgery; and whether the user had ever been put off accessing medicines due to their cost.

This is to be expected within multivariate analysis, the strength of which is its ability to detect variables that remain independently statistically significant after their simultaneous interaction with other variables are accounted for. The fact that these variables do not enter the final regression model does not mean that they are irrelevant to users' choice of method to access P medicines, only that they cannot add anything to the power of the model to predict the user's choice of consultation route over and above that of the 11 variables that were included in the final model. If there were compelling reasons to believe that there may be real affects associated with variables excluded from the model, then there may be a case for forcing their entry into the model. However, this was not felt to be the case.

Overall, there was good convergence between variables identified as statistically significant in both the univariate and multivariate analyses. Further, most of the variables included in the model moved in the directions one might have expected. Similarly, where variables dropped out of the model, post hoc rationalisations provided plausible explanations for this, after considering the variables remaining in the model. Reassuringly, no variables emerged as significant in the multivariate analyses that were not picked up in the univariate analysis. For these reasons, it was reasonable to accept the results of the logistic regression stepwise procedure.

4.6 Checking the specification and goodness of fit of the logistic regression model

Whenever a statistical model is built, it is important to examine the adequacy of the resulting model (Norusis, 1993; Hosmer & Lemeshow, 1989). This involves checking that the model is appropriately specified and does not violate the assumptions of logistic regression analysis methods. Further, it involves assessing the model's goodness of fit in order to ascertain how effective it is at predicting the outcome variable (Menard, 1995; Hosmer & Lemeshow, 1989).

4.6.1 Checking the model specification

Before discussing the findings of the model in detail and their relevance, it is essential to ensure that the model is correctly specified and that model building efforts were satisfactory (Hosmer & Lemeshow, 1989). There are two components to this: being satisfied that the model includes all relevant independent variables and no irrelevant independent variables; and that the functional form of the model is correct (Hosmer & Lemeshow, 1989; Menard, 1995). Mis-specification of the model may result in biased coefficients, inefficient estimates, and invalid statistical inferences (Menard, 1995).

4.6.1.1 Inclusion of all relevant independent variables and exclusion of all irrelevant independent variables

Given the relatively limited theory and knowledge of correlates regarding what influences user behaviour in the management of minor illness episodes using P class medicines and the resultant exploratory nature of the research, it is difficult to know the extent to which the model includes all relevant and no irrelevant independent variables. Nonetheless, efforts were made to address the overall robustness and stability of the model, re-running it in a number of different ways to check: whether the model remained recognisable; if it included broadly the same variables; and generally assessing the extent to which the stepwise method adopted 'creaked' under closer scrutiny.

4.6.1.2 'Jack-knifing' the sample

It is necessary to appreciate the kind of changes that could be expected from random variation in data. One way to assess this is to 'jack-knife' the data set, excluding a sub-sample of the study observations, developing a model based on the remaining subjects, and then testing the model in the originally excluded subjects (Hosmer & Lemeshow, 1989). The study data set is reasonably large, making it possible to select random sub-sets of cases with which to re-estimate the model. Table 4.12 compares the variables included in the model for the full sample of cases and for two randomly selected halves of the full sample. It shows that the top five-predictor variables from the full model were also included in the models fitted to the random halves of the data set. Further, the three models correctly predicted very similar proportions of cases overall (83.39% to 85.93%). Three variables that featured in the full model, yet not within the random halves models included, postcode (f6summ) marital status (f4mstat2) and longstanding illness (e13lgill). However, these were among the four least significant predictor variables within the full model. Only one new predictor variable, not included in the full model, entered one of the random halves models (e5sameph*g6pomtop) an interaction term of users who visited the same community pharmacy regularly and accessed a recently deregulated medicine. Generally though, the variables within the three models were broadly similar. This result was also borne out when the regression analysis was conducted on a random 75%/25% selection of the cases.

TABLE 4.12: VARIABLES INCLUDED WITHIN 'JACK-KNIFED' SUB-SAMPLE REGRESSION ANALYSES

Full Model	Random 50%	Random 50%	Random 25%	Random 75%
Phcode	Phcode	Phcode	Phcode	Phcode
E8payrx	E8payrx	G7blackl	E8payrx	E8payrx
G7blackl	G7blackl	E8payrx	G7blackl	G7blackl
E7regrx	E7regrx	E1yrnogp	E7regrx	E13lgill
E4yrnoph	E5sameph	E4yrnoph	E4yrnoph	E1yrnogp
E1yrnogp	E4yrnoph	E7regrx	F6summ	E4yrnoph
E5sameph	E5sameph*e8payrx		E5sameph	E5sameph
F6summ	E5sameph*g6pomtop		F3age	E5sameph*e8payrx
E5sameph*e8payrx				F4mstat2
F4mstat2				
E13lgill				

% Cases Correctly Classified by the Model

Full Model		Random 50%		Random 50%		Random 25%		Random 75%	
GP 1st	88	GP 1st	90	GP 1st	83	GP 1st	89	GP 1st	87
CP 1st	85	CP 1st	84	CP 1st	83	CP 1st	84	CP 1st	85
Overall	86	Overall	86	Overall	83	Overall	86	Overall	86

4.6.1.3 Comparing forward and backward stepwise variable selection procedures

Another way to assess the robustness of a statistical model and in particular to try to ensure that all and only relevant variables are included, is to test out different model building strategies e.g. forward and backward stepwise variable selection methods.

Forward stepping models start out including only the constant term, iteratively select the most significant predictor variables and adds them to the model, one by one, until none of the remaining terms offer any improvement in the predictive power of the model. In contrast, backward stepping models start off by including all variables in the model and iteratively remove the least significant variables, one by one, until only significant terms are left in the model. Ideally, the results of the backward elimination and forward inclusion methods of stepwise regression procedures will be the same. However, this may not always be the case. Occasionally 'suppressor' effects may arise. This is when a variable only reaches a statistically significant level when another variable is controlled or held constant. Consequently, a potential disadvantage to forward inclusion methods of stepwise regression is the possible exclusion of variables involved in suppressor effects. With backward elimination, because all variables are initially included in the model, there is less risk of failing to find existing relationships (Menard, 1995). Thus, backward elimination techniques may uncover relationships missed by forward inclusion. For this reason, both forward inclusion and backward elimination stepwise models were undertaken. The backward elimination stepwise approach yielded very similar results as the previously conducted forward stepwise regression (See Appendix 4). This result is reassuring, ruling out suppressor effects and validating the results of the forward stepping regression analysis.

4.6.1.4 Relaxing the statistical significance criteria for including variables within the regression model

Another way to try to ensure that all relevant variables are included within the model, is to relax the statistical significance threshold determining variables entering the regression model. The default inclusion criterion for variables within SPSS logistic regression is set at the conventional $p<0.05$ level. However, some analysts believe this to be too strict, running the risk of excluding important variables from the model.

Instead, they recommend that the statistical criterion for inclusion be set in the range 0.15 to 0.20. This results in an increased risk of rejecting the null hypothesis when it is true (finding a result that is not really there) but a lower risk of failing to reject the null hypothesis when it is false (not finding a relationship when it is there). This is particularly important within exploratory research, where there is a greater emphasis on finding good predictors, than eliminating bad ones (Menard, 1995).

Thus, the regression model was re-run, relaxing the inclusion criterion within the range 0.05 to 0.20. Table 4.13 summarises the result.

TABLE 4.13: VARIABLES ENTERING THE MODEL AFTER RELAXING THE DEFAULT INCLUSION CRITERIA

N=1185	Model 1 P=0.05	Model 2 P=0.10	Model 3 P=0.15	Model 4 P=0.20
Model chi-square (d.f.)	622.094 (27)	622.094 (27)	624.319 (28)	627.861 (30)
Significance level	0.000	0.000	0.000	0.000
Variables added to the model			e6farph	e6farph prelrx e7regrx* f5summ

Changing the inclusion criteria cut-off from $p<0.05$ to $p<0.10$ had no effect on the variables included in the model. Increasing it further to $p<0.15$ and $p<0.20$ changes the model very modestly, reducing the –2 log likelihood score change only marginally by 2.25 and 5.767 respectively, with the overall statistical significance remaining unchanged at the $p<0.0001$ level. When the inclusion criterion is set at $p<0.20$ three extra variables enter the regression model, distance to the community pharmacy (e6farph) price of P medicines relative to the prescription fee (prelrx) and an interaction term relating to receipt of prescription medicines and accommodation (e7regrx*f5summ). Otherwise, the model remains the same. Of these three variables, one was highly significant (prelrx $p<0.001$) and another marginally non-significant (e6farph $p=0.0831$) in the univariate analyses. However, they only enter the regression model when the inclusion criterion is relaxed considerably.

Overall, relaxing the inclusion criterion threshold exerts little influence regarding variable entering the regression model and the predictive performance of the model. For this reason, adopting the conventional default inclusion criterion ($p<0.05$) did not appear to be excluding potentially relevant variables from the model. Thus, the results of the initial regression model were accepted and the default inclusion criterion threshold ($p<0.05$) adopted in the analysis.

Analysis procedures to assess whether the forward inclusion stepwise technique adopted was including only relevant variables suggest that the model remained fairly robust and stable, in that it consistently identified and selected the same variables as relevant to the model. Assessing the extent to which the regression model included all relevant variables is more difficult. Given the exploratory nature of the research and the relative lack of information regarding theoretically relevant variables, omitted variable bias may be present (Menard, 1995). Further, detailed external validation of the model would, however, be required to be able to conclude that the model is indeed truly robust and includes all relevant variables and therefore useful to predict users' choice of consultation route to access P medicines. This would require obtaining new samples of data to assess the performance of the previously developed model (Hosmer & Lemeshow, 1989). The aim of this process would be to replicate the study results, simultaneously developing and testing theories that potentially explain why certain variables emerge as predictors. Until that time, these results must be regarded as tentative and inconclusive (Menard, 1995).

4.6.1.5 Testing the functional form of the regression model

The next stage in checking the model specification involves checking its functional form. A key assumption underpinning the correct specification of logistic regression models is that the form of the relationship is linear (Menard, 1995). Consequently, the logistic regression model will be mis-specified if it is equal to a non-linear combination of the independent variables or if the relationship between some or all of the independent variables is multiplicative or interactive, rather than additive (Menard, 1995). In order to ensure that the linearity and additivity assumptions hold, a number of key considerations in the model building process include: selection of an

appropriate transformation function; checking for linearity; and prior hypothesising and investigating potential interactions within the model.

4.6.1.6 Choice of transformation function

Model mis-specification can result from inappropriate choice of transformation function to facilitate the regression analysis of dichotomous data. However, mis-specification as a result of using the logistic function as opposed to a different 'S' shaped function is less likely to be a problem. Logit and probit models produce very similar results (Menard, 1995; Collett, 1999). Further, Hosmer and Lemeshow note that the logarithmic and other similar symmetric models are virtually identical in the range 0.2 to 0.8 (Hosmer & Lemeshow, 1989). There is usually little theoretical basis for preferring an alternative model

4.6.1.7 Checking for linearity

For continuous scaled variables, we should check the assumption of linearity in the logit (Hosmer & Lemeshow, 1989). However, given that there are very few continuous variables included within the regression model and no reason to expect any non-linear relationships, formal tests of linearity were not undertaken. Re-running the model with all continuous variables re-coded to make them categorical did not substantively alter the results. Linearity in the logit was, therefore, assumed.

4.6.1.8 Testing for collinearity and multicollinearity

One further important characteristic of generalised linear models, such as logistic regression model, is that they assume independent, or at least uncorrelated, observations (McCullagh & Nelder, 1983). Collinearity or multicollinearity, is the undesirable situation where the correlation among independent variables is strong. Collinearity among the predictors can lead to biased estimates and inflated standard errors (Norusis, 1993; Menard, 1995). A variety of collinearity diagnostics are available in standard linear regression analysis (Norusis, 1993). One of these, the 'tolerance' statistic can also be applied to logistic regression models. Tolerance statistics for individual variables can be used to determine the extent to which the independent variables are linearly related to one another (multicollinear). The tolerance statistic measures the proportion of a variable's variance not accounted for

by other independent variables in the equation. A variable with very low tolerance contributes little information to a model and can cause computational problems (Norusis, 1993). A tolerance statistic less than 0.2 indicate cause for concern and if it is less than 0.1 this is indicative of a serious collinearity problem (Menard, 1995).

Tolerance statistics can be obtained for logistic regression models by calculating a standard linear regression model using the same dependent and independent variables. As the main concern of this statistic is to investigate the relationship between independent variables, the functional form of the model for the dependent variable is irrelevant to the estimation of collinearity (Menard, 1995). Table 4.14 outlines the tolerance statistics calculated for the independent variables within the logistic regression model. It shows that all the tolerance statistic for all the independent variables exceed 0.50, indicating no serious problem of collinearity (Menard, 1995).

TABLE 4.14: TOLERANCE STATISTICS FOR INDEPENDENT VARIABLES, TESTING FOR COLLINEARITY

INDEPENDENT VARIABLES	TOLERANCE STATISTIC
Community Pharmacy variables	
Community pharmacy	0.954
Chain or independent	0.911
Demographic Characteristics	
Sex	0.980
Ethnicity	0.976
Age	0.744
Marital Status	0.816
Socio-economic Characteristics	
Accommodation type	0.841
Postcode	0.871
Access to a car or van	0.859
Employment status	0.519
Age completed f/t education	0.788
Self-reported General Health Status	
Self-reported general health status	0.699
Any longstanding illness	0.631
Use of General Practice and Community Pharmacy Services	
No. of GP consultations in the last year	0.780
No. of CP consultations in the last year	0.863
Use the same CP regularly	0.962
In receipt of regular Rx	0.603
Access to General Practice and Community Pharmacy Services	
Usual waiting time for a GP apptmt.	0.967
Distance to GP surgery from home	0.919
Distance to CP from home	0.968
Cost of Medicines	
Prescription exemption status	0.801
Put off obtaining medicines due to cost	0.860
OTC price relative to the Rx fee	0.938
Type of Medicines	
Recently deregulated P medicine	0.850
Medicine on NHS blacklist	0.963

4.6.1.9 Investigating potential interactions between independent variables

Combinations of variables sometimes have a different effect than you would expect from each of the variables alone within a model (Norusis, 1993). Interactions or non-additivity occurs between variables that are not independent. The presence of interaction terms means that the effect of one of the independent variables is not constant over levels of the others i.e. when the change in the dependent variable associated with a one-unit change in an independent variable depends on the value of one of the other independent variables. (Hosmer & Lemeshow, 1989; Menard, 1995). However, only interaction terms that one may have prior reason to believe might exist should be investigated. To this end, a number of plausible potential interactions between independent variables were tested. These were derived by considering, a priori, whether individual variables weakly associated with the outcome might become important predictors when taken together. Including terms in the model that are a product of single terms did this (Norusis, 1993). For example, age and sex were and were not respectively significantly associated with choice of access route in the univariate analyses. However, other research indicates that these variables can have a cumulative effect on illness burden and use of health services when taken together. For this reason, age and sex were investigated to explore whether in interaction they were significantly associated with the outcome. Other plausible interaction effects were hypothesised and entered one at a time to assess if they would emerge as significant predictor variables within the model. The interaction terms tested are summarised in table 4.15.

TABLE 4.15: INTERACTION TERMS ENTERED INTO THE LOGISTIC REGRESSION MODEL

Interaction Variable	Interpretation
F1sex*f3age	Sex and age
E7regrx*e13lgill	Regular prescription medicine and longstanding illness
E1yrnogp*e13lgill	No. of times consulted the GP in last year and longstanding illness
E4yrnoph*e13lgill	No. of times consulted the CP in last year and longstanding illness
E5sameph*e13lgill	Use same CP regularly and longstanding illness
E5sameph*e7regrx	Use same CP regularly and regular prescription medicine
E5sameph*g6pomtop^{+}	**Use same CP regularly and deregulated medicine**
E5sameph*e8payrx$^{+\$}$	**Use same CP regularly and pay for prescriptions**
E8payrx*f3age	Pay for prescriptions and age
E8payrx*f8empcat	Pay for prescriptions and employment category
E8payrx*f5summ	Pay for prescriptions and homeownership
E11ctoff*f5summ	Ever put off by the cost of medicines and homeownership
E7regrx*f5umm^{+}	**Regular prescription and homeownership**

$^{+}$ emerged as a significant predictor variable when added individually to the model
$^{+\$}$ included in the final regression model as a significant predictor variable

Three of the thirteen interaction terms prior hypothesised to potentially predict outcome emerged as significant predictors when added individually to the regression model – e5sameph*g6pomtop, e5sameph*e8payrx and e7regrx*f5summ (highlighted in bold). These three interaction terms were included in subsequent regression analyses. However, only one of these interaction terms emerged as a significant predictor variable in the final regression model – e5sameph*e8payrx. Users who used the same pharmacist regularly and who paid for their prescriptions were significantly more likely to try the community pharmacist first to access their P medicine (OR=1.61). These may be users who, through time, have developed a relationship with their community pharmacist whose advice they seek regarding over-the-counter equivalents to prescription medicines, perhaps to save them either time or money.

4.7 Assessing the goodness of fit of the logistic regression model

Once satisfied regarding the variables included and the functional form of the model at the model building stage, the next step in assessing the model is to ascertain how effective the model we have developed is at predicting the outcome variable (Hosmer & Lemeshow, 1989). This involves assessing the 'goodness of fit' of the model. Goodness of fit is, however, something of a misnomer, as what we are actually measuring is how distant the model is from the data (Collett, 1999).

Fitting a model may be regarded as a way of replacing a set of data values with a set of fitted values, derived from a model. However, the fitted values generated by the model do not exactly reproduce the original data. The question is, how discrepant they are? While a small discrepancy may be tolerable, a large one is not (McCullagh & Nelder, 1983).

Thorough assessment of the goodness of fit of the model will involve both the calculation of summary measures of distance between observed and predicted values, as well as examination of the individual components of these measures, the aim of which is to identify points or cases that the model does not fit well, or that exert a strong influence on the coefficient estimates (Hosmer & Lemeshow, 1989; Norusis, 1993). A variety of diagnostic methods are available to investigate the fit of logistic regression models including summary goodness of fit statistics and analysis of residual measures, useful for investigating influential and outlier variables.

4.7.1 Summary goodness of fit measures

Three separate summary measures were used to investigate the overall goodness of fit of the model, including: a classification table; the model chi-square, goodness of fit statistic; and the Hosmer-Lemeshow goodness of fit statistic which assesses model fit across sample deciles.

4.7.2 The classification table

One way to assess how well the models fits is to compare its predictions to the actual observed outcomes (Norusis, 1993). One method of determining how well the logistic regression model performs is to consider the crude misallocation rate of the model. This is done by examining the proportion of users that the model predicted would consult the general practitioner, who actually did and the proportion of users that the model predicted would consult the community pharmacist who actually did. This is summarised in table 4.16.

TABLE 4.16: CLASSIFICATION TABLE FOR DEPENDENT VARIABLE, GP OR CP FIRST (CUT VALUE 0.75)

		Predicted		Percent Correct
		GP first	CP first	%
Observed	GP first	242	32	88
	CP first	122	678	85

Three quarters of the recruited sample visited the community pharmacist first to obtain their P medicine. For this reason, the cut value for the classification table was set at 0.75. So, for each predicted group the table shows whether the estimated probability is greater or less than 0.75.

The results indicate that 88.32% of users (242/274) who visited the general practitioner first and 84.75% of users who visited the community pharmacy first (678/800) were correctly predicted by the regression model to do so. Conversely, 122 users predicted by the model to visit the general practitioner first actually went to the community pharmacy first and 32 users predicted by the model to visit the community pharmacist first actually visited the general practitioner first to obtain their P medicine.

Overall, the model correctly predicted 85.66% (920/1074) of the users and misallocated 14.34% (154/1074) of users. Further, it correctly predicts membership between the general practitioner and community pharmacy groups almost equally well at 88.32% and 84.75% respectively.

4.7.3 Model chi-square test

The classification table and histogram of estimated probabilities provide a useful broad indication of how well, or otherwise, that the logistic regression model classifies the observed data. However, we also need to test the model across the whole range of probability estimates it produces. Considering the probability of observed results, as measured by the 'likelihood' and related model chi-square goodness of fit statistic does this (Norusis, 1993).

A good model generates high likelihood of the observed results. This translates into a small value for the '-2 times the log of the likelihood' (-2LL) statistic. Ideally, the improvement in the model between including only the constant term and the significant predictor variables included within the final regression model, should result in a decrease in the –2LL score. Indeed, the change in the –2LL score ({-2LL for the model containing only the constant term} – {-2LL for the model containing the significant independent variables}) constitutes the basis of the model chi-square goodness of fit statistic. This tests the null hypothesis that the coefficients for the independent variables included in the regression model are zero (Norusis, 1993). If the model chi-square is statistically significant, then we can reject the null hypothesis and conclude that information about the independent variables allow us to make better predictions than without them (Menard, 1995; Norusis, 1993). Results of the model chi-square goodness of fit statistic are summarised in table 4.17

TABLE 4.17: -2 TIMES THE LOG OF THE LIKELIHOOD (-2LL) SCORES & THE MODEL CHI-SQUARE GOODNESS OF FIT TEST RESULTS

-2LL for model containing only the constant term [a]		1219.8311
-2LL for model containing significant independent variables [b]		597.737
	Chi-square	**Significance**
Model chi-square *	622.094	0.000

*Model chi-square = a – b

It indicates that the –2LL figure decreases markedly, from 1219.8311 for the model including only the constant term, to 597.73 for the full model including the significant independent variables. The model chi-square is the difference in the –2LL between these two steps and is 622.094. This goodness of fit statistic is

assessed using the chi-square distribution and is statistically significant at the $p<0.0001$ level. Thus, we can conclude that the independent variables included in the model allow us to significantly improve prediction of the outcome variable.

4.7.4 Hosmer-Lemeshow goodness of fit test

Hosmer and Lemeshow (1989) propose a more sophisticated method to assess the goodness of fit of logistic regression models. They recommend grouping the users in the sample into deciles, according to the value of their estimated probabilities, with the first group having the smallest estimated probability values and the last group the largest (Hosmer & Lemeshow, 1989). Their goodness of fit statistic is then obtained by calculating the Pearson chi-square statistic from a table of observed and expected estimated frequencies across the sample deciles. SPSS output produces the Hosmer-Lemeshow goodness of fit test. Results of applying the decile grouping strategy to the estimated probabilities computed from the regression model are shown in table 4.18.

TABLE 4.18: OBSERVED (OBS.) & ESTIMATED EXPECTED (EXP.) FREQUENCIES WITHIN EACH SAMPLE DECILE FOR EACH OUTCOME (GP OR CP FIRST) USING THE FITTED LOGISTIC REGRESSION MODEL

Group		Decile										Total
		1	2	3	4	5	6	7	8	9	10	
GP First	Obs.	98	77	50	28	11	6	3	1	0	0	274
	Exp.	99	77	48	25	11	6	2	1	0	0	274
CP First	Obs.	9	30	57	79	96	102	104	106	107	110	800
	Exp.	7	29	58	81	95	101	104	105	106	109	800
Total		107	107	107	107	107	108	107	107	107	110	1074

The Hosmer-Lemeshow test provides valuable descriptive information, facilitating assessment of the fitted model over the sample deciles of estimated probabilities. Comparing the observed and expected frequencies in each decile potentially pinpoints regions where the model does not provide a good fit. Comparisons of the observed and expected frequencies within the table's cells indicate similar values, suggesting that the model fits within each of the sample deciles. Further, as expected, the majority of users who adopted a general practitioner route appeared in the lower estimated probability decile groupings and most of those adopting a community pharmacist route are clustered in the higher estimated probability decile groupings. These results are confirmed by a small value for the Hosmer-Lemeshow goodness of fit statistic, 1.6592, the corresponding p value (computed from the chi-square distribution with 8 degrees of freedom) for which is 0.9897, indicating a very good overall fit.

4.7.5 Analysis of residuals

Analysing residuals using a variety of diagnostic methods offer another route via which to assess the fit of a model, identifying cases for which the model works poorly or that exert undue influence on the parameters of the model (Menard, 1995). The residual is the difference between the observed and predicted probability of an outcome based on the model (Norusis, 1993). For example, if the model predicts the probability of visiting the community pharmacist first to be 0.9 for a user who does use the community pharmacist, the residual is 0.1 (1.0 – 0.9). For large sample sizes, certain residuals should be approximately normally distributed. This results from the

fact that the normal and binomial distributions are about the same for large samples. If this is the case, we can be more confident in the inferential statistics derived from the model (Norusis, 1993; Menard, 1995).

The standardised and deviance residuals, should be approximately normally distributed for large samples, with means of zero and standard deviations of one (Norusis, 1993; Menard, 1995). Standardised residuals are simply residuals divided by the estimate of their standard deviation. Deviance residuals measure how well the model fits individual cases. Large values for deviance residuals indicate a poor fit with the model. Plotting histograms of the model standardised and deviance residuals indicated that they were indeed approximately normally distributed, with means very close to zero (0.02 and 0.07 respectively) and standard deviations approaching one (0.85 and 0.74 respectively).

Analyses of residuals facilitate identification of influential variables and/or outlier cases. Cases with unusually high or low vales on the independent variables, or with unusual combinations of values on the dependent and independent variables, may exert a disproportionate influence on the estimated parameters, if they have a big effect on the slope of the regression line. Similarly, outliers can emerge if a case has unusually high or low values on one variable or an unusual combination of two or more variables. It is not always the case that outlier cases contain influential variables.

In addition to the standardised residual and deviance measures, a number of other residual analysis techniques are available to identify influential variables and outlier cases, including: Cook's distance, leverage and studentised residuals.

Cook's distance measures the influence of a case. It indicates how much deleting particular cases affect not only the residual for the case concerned, but also for the remaining cases i.e. it is a measure of change in all residuals when an observation is omitted (Norusis, 1993). Plots of the Cook's distance residual by case number identified only one influential case, number 485.

Leverage values are used to detect observations that have a large impact on predicted values. Leverage values are bounded by zero and one. Cases with leverage values of zero exert no influence, whereas if a leverage value equals one, the observation/case is largely determining parameters in the model (Menard, 1995). The average leverage value for a sample is p/n, where 'p' is the number of estimated parameters in the model, including the constant, and 'n' is the sample size (Norusis, 1993). Thus, the average leverage value for the model presented is 0.026 (28/1074). Plotting sample leverage values by case number highlighted that case 545 exhibited a much higher leverage value that the others.

The studentised residual for a case is the change in the model deviance if the case is excluded (Norusis, 1993). Discrepancies between the deviance and studentised residuals may identify unusual cases.

The standardised and deviance residuals are particularly useful for identifying cases for which the model fits poorly. In particular, it is advisable to investigate cases with standardised or deviance residuals greater or less than +2 or –2 . Given the normal distribution of these residuals, 95% of cases should have values between –2 and +2 and 99% of cases between –2.5 and +2.5 (Menard, 1995). Indeed, SPSS can identify cases with standardised residuals greater than 2. Table 4.19 reports the 10 cases with the most discrepant fit (including cases 485 and 545) across a number of these key residuals. It identifies the case number, the observed and predicted values of the cases, the standardised residual, Cook's distance, leverage, studentised residual, deviance, model chi-square excluding the case, and the difference between the model chi-square value including and excluding the case (Menard, 1995).

TABLE 4.19: LOGISTIC REGRESSION GOODNESS OF FIT DIAGNOSTIC SUMMARY

Case No.	Obs. Value	Pred. Value	Std. Residual	Cook's Distance	Leverage	Student Residual	Deviance	Model Chi-Square	Change in Model Chi-Square
545	0	0.98	-7.33	0.373	0.006	-2.8	-2.82	627.7	5.6
485	0	0.96	-5.14	1.183	0.042	-2.6	-2.57	627.2	5.1
133	0	0.96	-4.92	0.416	0.016	-2.5	-2.54	626.2	4.1
853	1	0.04	4.61	0.351	0.016	2.5	2.49	628.0	5.9
561	0	0.95	-4.40	0.483	0.024	-2.4	-2.45	625.8	3.7
292	0	0.96	-5.30	0.307	0.010	-2.6	-2.59	626.4	4.3
287	0	0.96	-4.95	0.357	0.014	-2.5	-2.546	626.2	4.1
712	1	0.05	4.17	0.254	0.014	2.4	2.41	627.5	5.4
936	0	0.93	-3.89	0.212	0.013	-2.3	-2.35	625.1	3.0
1069	0	0.93	-3.71	0.219	0.015	-2.3	-2.32	624.9	2.8
						Full Model Chi-Square (28d.f.)		**622.094**	**N/A**
						Model Chi-Square Excl. 10 cases (28d.f.)		**669.736**	**47.642**

The overall aim in analysing residuals is to identify cases to re-examine and make a judgement about whether they should be retained or possibly excluded from the model. Examining table 4.19, case number 545 stands out. The standardised residual is large at –7.3315 and the studentised residual is just under –3 (-2.83924), both indicators of a poor fit. In addition, this case was previously identified as exhibiting the most discrepant leverage value in the sample. Deleting cases 545 from the analysis would increase the model chi-square statistic by 5.656. Deleting each of these poorly fit cases would improve the model chi-square between 2.872 and 5.982. Further, deleting them all would improve the model chi-square by 47.642. However, final decision regarding whether or not to remove these discrepant cases requires closer scrutiny of the data. It may be that, while these cases may be unusual, they may also contain entirely plausible data, in which case they should be retained in the analysis (Menard, 1995). Menard notes: "even cases with very large residuals do not necessarily indicate problems in the model, in so far as we are dealing with non deterministic models in which individual human choice and free will may naturally provide less than perfect prediction of human behaviour" (Menard, 1995). Ultimately, researcher discretion must be exercised. The ten most obvious outlier cases were investigated further. This revealed that there were in fact plausible

explanations as to why the model may have mis-specified them. Thus, the decision was taken to keep them in the data set.

While it is important to examine goodness of fit, it is important to avoid 'over-fitting' a model and keep in mind the distinction between getting a model to fit and maintaining a conceptually sound model (Hosmer & Lemeshow, 1989). McCullagh and Nelder caution that "all models are wrong", warning researchers to avoid "falling in love with one model to the exclusion of all others" (McCullagh & Nelder, 1983). Doubtless, there are several possible models. No one model can ever be termed the 'correct' model (Collett, 1999).

Overall, validation procedures examining both the specification and goodness of fit of the model suggest that across the whole sample, the model performs relatively well at predicting users' choice to visit either the general practitioner or community pharmacist to access a P medicine. As expected though, the model is not able to perfectly predict user choice. There are other factors, perhaps related to the community pharmacies, the areas that they are in, or indeed the users themselves which influences their choice to access P medicines from the general practitioner or community pharmacist. The ultimate test of the model, however, concerns how well it would work (i.e. whether it can correctly predict user choice) with another (out-of-sample) data set. It was not possible to test this within this study. However, it highlights an interesting area for further research.

4.8 Summary of policy relevant results

BOX 4.1: SUMMARY OF POLICY RELEVANT RESULTS

Users were significantly more likely to access a P medicine from a community pharmacist rather than a general practitioner if:
• Single; the more often they had consulted a community pharmacist in the last year; if they paid for prescription medicines; if they used the same community pharmacy regularly; and if they wished to receive a medicine 'blacklisted' from the NHS prescribing list.
Users were significantly less likely to access a P medicine from a community pharmacist rather than a general practitioner if:
• The medicine was for a child; if they lived in a deprived area; if they reported presence of a longstanding illness; the more often they had consulted with a general practitioner in the last year; if they used the same community pharmacy regularly; and if they received regular prescription medicines. • Relative cost of medicines compared to prescription charges; burden of illness (implying regular use of general practitioners); habit (using the same community pharmacist and seeing a general practitioner regularly); as well as being loyal to particular brands of medicines seem likely to be important influences in attempts to self-medicate using a P class medicine obtained from a community pharmacy. • Usual waiting time to see a general practitioner was not predictive of users' likelihood to attempt substitution, contrary to expectations. • Neither age nor general health status were predictive of substitution.

Chapter 5:

Time and resource costs of accessing P medicines from general practitioners and community pharmacists

5.1 Introduction

The overall objective of this chapter is to investigate the welfare implications associated with the changing distribution of time and resource costs accruing to stakeholders associated with accessing P class medicines from general practitioners and community pharmacists. Four sets of analyses were conducted to fulfil that objective, including: (1) costing analysis, identifying the main costs (direct and indirect) accruing to stakeholders, highlighting differences depending on the access route adopted; (2) consumer surplus analyses, estimating the net consumption benefits (or costs) to users facing different time and resource costs, dependent upon the access route adopted; (3) Modelling the impact on net benefits to both users and the health sector resulting from numerous policy scenarios; and (4) economic evaluation (cost minimisation analysis) assessing the relative cost and efficiency to both users and the health sector of accessing P class medicines via prescription or over-the-counter routes.

In the results that follow, estimates relating to users' initial choice of access route were derived using data from the full study sample (n=1185). Estimates referring to initial *and* follow-up user visits were derived from the sub-sample of users who participated in both the community pharmacy and telephone follow-up questionnaires (n=717).
Stakeholders refer to users, general practitioners and community pharmacists. Alternate study perspectives (societal, user/family and health sector) comprise varied combinations of these stakeholders. Key cost elements included under each were outlined in Table 2.1 in Chapter 2 and the unit costs applied to value these resources were summarised in Table 2.2 in Chapter 2.

Time and resource costs are reported. Time costs highlight the time consequences to stakeholders associated with the two routes for accessing P medicines. Resource cost is a broader category, encapsulating all resources expended by stakeholders in the process of accessing P medicines (i.e. time, travel, medicine and special arrangement costs). Two main resource categories were costed - time and travel and medicine costs, with total costs derived as the sum of both.

The cost of medicines represented the vast majority of the out-of-pocket financial costs met by users and thus may be taken as a reasonable proxy for their actual money costs. A small number of users also incurred monetary costs associated with their method of travel to obtain their medicine. However, these were minor, with similar means and ranges between different groups of users and were far outweighed by any medicine costs. For those reasons, travel costs were not separately quantified, as they were felt unlikely to change either the direction or magnitude of the key results.

All time and resource costs presented are mid-estimates, excluding costs associated with any special arrangements made by users when accessing their medicine(s). High and low cost estimates are presented within supplemental tables included in the appendices, as are estimates including any special arrangement costs incurred by users (See tables A5.1 – A5.24 in Appendix 5). Where differences emerged between these estimates, they are reported. Finally, more detailed breakdowns of time and resource cost estimates were summarised and reported in appendices where they were thought to represent a useful reference source for future community pharmacy research.

5.2 Costing analysis of varied user access routes

Summary time and resource costs incurred by stakeholders in each of the initial and follow-up visits adopted by users to access P medicines are presented in table 5.1. Monetary valuation of these resources is outlined in table 5.2. For simplicity, only mean and total time and resource costs are presented. Actual time and resource costs to stakeholders, broken down by the constituent elements of the varied routes to access P medicines (travel, special arrangement(s), waiting and consulting time) are outlined in tables A5.1 –A5.7 in Appendix 5, alongside relevant summary statistics. Tables A5.4 – A5.7 in Appendix 5 also report the low and high money cost estimates calculated as part of the sensitivity analyses undertaken to test the robustness of results.

TABLE 5.1: SUMMARY TIME COSTS ACCRUING TO STAKEHOLDERS FOR INITIAL & FOLLOW-UP VISITS TO ACCESS P MEDICINES

User Time Costs (Incl. Special Arrangements*)	Mean (minutes)	Sum (hours)
Initial visit: P medicine on Rx in general practitioner apptmt. (n=176)	79	233
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	51	108
Initial visit: P medicine bought OTC at community pharmacy (n=882)	19	280
Total Initial visit		**621**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	117	237
Follow-up visit: community pharmacist follow-up visit (n=44)	19	14
Total Follow-up visit		**251**
Overall Total User Time costs (initial & follow-up visits)		**872**
User Time Costs (Excl. Special Arrangements*)	**Mean (minutes)**	**Sum (hours)**
Initial visit: P medicine on Rx in general practitioner apptmt.(n=176)	52	153
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	28	60
Initial visit: P medicine bought OTC at community pharmacy (n=882)	14	204
Total Initial visit		**417**
Follow-up visit: general practitioner follow-up apptmt.(n=122)	68	137
Follow-up visit: community pharmacist follow-up visit (n=44)	16	12
Total Follow-up visit		**149**
Overall Total User Time Costs (initial & follow-up visits)		**566**
General Practitioner Time Costs	**Mean (minutes)**	**Sum (hours)**
Initial visit: P medicine on Rx in general practitioner apptmt.(n=176)	12	35
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	5	11
Initial visit: P medicine bought OTC at community pharmacy (n=882)	0	0
Total Initial visit		**45**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	13	27
Follow-up visit: community pharmacist follow-up visit (n=44)	0	0
Total Follow-up visit		**27**
Overall Total General Practitioner Time Costs (initial & follow-up visits)		**72**
Community Pharmacy Time Costs	**Mean (minutes)**	**Sum (hours)**
Initial visit: P medicine on Rx in general practitioner apptmt. n=176)	4	11
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	4	8
Initial visit: P medicine bought OTC at community pharmacy (n=882)	1	15
Total Initial visit		**34**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	4	8
Follow-up visit: community pharmacist follow-up visit (n=44)	1	1
Total Follow-up visit		**9**
Overall Total Community Pharmacy Time Costs (initial & follow-up visits)		**43**
NHS Time Costs	**Mean (minutes)**	**Sum (hours)**
Initial visit: P medicine on Rx in general practitioner apptmt. (n=176)	16	46
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	9	19
Initial visit: P medicine bought OTC at community pharmacy (n=882)	1	15
Total Initial visit		**80**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	17	34
Follow-up visit: community pharmacist follow-up visit (n=44)	1	1
Total Follow-up visit		**35**
Overall Total NHS Time Costs (initial & follow-up visits)		**115**

*Special arrangements included mainly time-off work and childcare.

Mean user time costs ranged between 14-68 minutes overall. As expected, buying medicines over-the-counter was the quicker and obtaining a prescription the slower route through which users could access P medicines, with general practitioner access routes increasing user time costs threefold compared to community pharmacist access routes. Differences in mean time costs, depending on whether the user visited either the general practitioner or community pharmacist, were statistically significant at the $p<0.000$ level (t-test).

A rule of halves emerges. Buying P medicines over-the-counter from the community pharmacist took between 14-16 minutes; approximately half as long as accessing a P medicine on repeat prescription from a general practitioner (28 minutes on average); which, in turn, took around half as long as accessing a P medicine during a general practitioner consultation (52-68 minutes on average). For a summary of difference in mean time costs across key study samples and associated summary statistics, see table A5.8 in Appendix 5.

TABLE 5.2: SUMMARY MONEY COSTS (£) ACCRUING TO STAKEHOLDERS IN INITIAL & FOLLOW-UP VISITS TO ACCESS P MEDICINES

User Money Costs – Total [1]	**Mean (£)**	**Sum (£)**
Initial visit: P medicine on Rx in general practitioner apptmt.(n=176)	6.14	1081
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	4.88	620
Initial visit: P medicine bought OTC at community pharmacy (n=882)	6.00	5296
Total Initial visit		**6997**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	6.21	757
Follow-up visit: community pharmacist follow-up visit (n=44)	7.17	316
Total Follow-up visit		**1073**
Overall Total User Cost (initial & follow-up visits)		**8070**
User Money Costs – Time & Travel Costs Only (Excl. Special Arrangements*) [2]	**Mean (£)**	**Sum (£)**
Initial visit: P medicine on Rx in general practitioner apptmt. (n=176)	6.93	1219
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	4.33	550
Initial visit: P medicine bought OTC at community pharmacy (n=882)	2.17	1912
Total Initial visit		**3681**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	9.14	1115
Follow-up visit: community pharmacist follow-up visit (n=44)	2.58	114
Total Follow-up visit		**1229**
Overall Total User Time & Travel Cost (initial & follow-up visits)		**4910**
User Money Costs – Medicines Only [3]	**Mean (£)**	**Sum (£)**
Initial visit: P medicine on Rx in general practitioner apptmt. (n=176)	0.86	151
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	0.55	70
Initial visit: P medicine bought OTC at community pharmacy (n=882)	3.84	3390
Total Initial visit		**3611**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	2.42	296
Follow-up visit: community pharmacist follow-up visit (n=44)	4.70	207
Total Follow-up visit		**503**
Overall Total User Medicine Costs (initial & follow-up visits)		**4114**
General Practitioner Money Costs [4]	**Mean (£)**	**Sum (£)**
Initial visit: P medicine on Rx in general practitioner apptmt. (n=176)	14.77	2599
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	6.48	823
Initial visit: P medicine bought OTC at community pharmacy (n=882)	1.23	1081
Total Initial visit		**3422**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	16.29	1988
Follow-up visit: community pharmacist follow-up visit (n=44)	0.00	0
Total Follow-up visit		**1988**
Overall Total General Practitioner Costs (initial & follow-up visits)		**5410**
Community Pharmacy Money Costs [5]	**Mean (£)**	**Sum (£)**
Initial visit: P medicine on Rx in general practitioner apptmt. (n=176)	13.49	2374
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	15.28	1941
Initial visit: P medicine bought OTC at community pharmacy (n=882)	0.45	397
Total Initial visit		**4712**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	14.77	1506
Follow-up visit: community pharmacist follow-up visit (n=44)	0.45	20
Total Follow-up visit		**1526**
Overall Total Community Pharmacy Costs (initial & follow-up visits)		**6238**
NHS Money Costs [6]	**Mean (£)**	**Sum (£)**
Initial visit: P medicine on Rx in general practitioner apptmt. (n=176)	28.25	4972
Initial visit: P medicine on Rpt Rx from general practitioner (n=127)	21.76	2764
Initial visit: P medicine bought OTC at community pharmacy (n=882)	**1.68**	1478
Total Initial visit		**9214**
Follow-up visit: general practitioner follow-up apptmt. (n=122)	**28.64**	3494
Follow-up visit: community pharmacist follow-up visit (n=44)	0.45	20
Total Follow-up visit		**3514**
Overall Total NHS Costs (initial & follow-up visits)		**12728**

1 includes the cost to users associated with: waiting time at the GP surgery; time in consultation with GP; travel time to the GP surgery; special arrangements made to attend GP appointment; travel time to the pharmacy; waiting time in the pharmacy; and special arrangements made to visit the pharmacy.
2 includes the cost to users associated with: waiting time at the GP surgery; time in consultation with GP; travel time to the GP surgery; travel time to the pharmacy; and waiting time in the pharmacy (i.e. user costs, excluding special arrangement costs).
3 includes the cost to users associated with: payment of prescription fees; payment for prescription exemption certificate; and prices paid to buy over-the-counter medicines.
4 includes the costs to GPs associated with: time in consultations; signing repeat prescriptions; and administering repeat prescription services.
5 includes the cost to pharmacists associated with: prescription dispensing; advice giving on prescription medicines; advice giving on over-the-counter medicines; professional allowances and feels and the net ingredient costs of medicines prescribed through the NHS.
6 includes the cost to the NHS associated with: general practitioner time; community pharmacy time; and the net ingredient cost of medicines prescribed through the NHS (i.e. is the sum of general practitioner and community pharmacy costs).

Mean monetary valuation of the resources consumed by users accessing P medicine(s) ranged between £4.88 and £7.17 overall. Mean total costs were lowest among users accessing their P medicines on repeat prescription from a general practitioner. This is because time and out-of-pocket money costs to users were typically lower in this access route compared to attending an appointment with a general practitioner and buying a medicine direct from a community pharmacist respectively. The monetary valuation of total resources consumed by users buying their P medicines over-the-counter were very similar to those accessing them during a general practitioner appointment for users in both initial and follow-up access routes.

Straight comparison of mean total costs incurred by users accessing P medicines from general practitioners (whether through appointments or repeat prescription systems) compared to community pharmacists, revealed significantly higher costs within general practitioner access routes in both full ($n=1185$, $p<0.023$) and follow-up ($n=717$, $p<0.003$) samples. For a summary of the mean total user money costs (mid-estimates) across the key samples and associated summary statistics, see table A5.9 in Appendix 5.

Time and travel cost estimates represent the indirect costs met by users. Accessing P medicines from general practitioners incurred higher time and travel costs (double if accessed through repeat prescription systems and treble if users actually attended an appointment with a general practitioner) compared to buying P medicines over-the-

counter. These differences in mean time and travel costs incurred by users were statistically significantly ($p<0.000$, t-test) across all key samples. For a summary of the mean total time and travel costs (mid-estimate) to users, see table A5.10 in Appendix 5. Medicine costs represent the main, and usually the only, out-of-pocket expenditure incurred by users across the various access routes. As such, they can be seen as representing the monetary cost actually met by users. Buying P medicines over-the-counter incurred higher medicine costs in both initial and follow-up access routes and again these differences were statistically significantly ($p<0.000$). For a summary of the mean total medicine(s) cost (mid-estimate) met by users and associated summary statistics, see table A5.11 in Appendix 5.

Resource costs to general practitioners of prescribing P medicines during an appointment cost more than double that of issuing them through repeat prescriptions and costs to community pharmacists increased hugely when dispensing P medicines on prescription compared to selling them over-the-counter.

Overall, the pattern of results reported above were broadly replicated in sensitivity analyses exploring the impact of both high and low mean user cost estimates, as well as within the majority of sub-sample groupings (see tables A5.3 – A5.7 in Appendix 5).

In summary, monetary valuation of resources consumed indicates that users accessing P medicines on prescription from general practitioners (whether in the course of an appointment or through repeat prescription systems) incurred significantly higher resource costs overall, compared to users buying their P medicines over-the-counter from community pharmacies. However, the two main constituent resource cost elements

consumed by users moved in opposite directions. Time and travel (i.e. indirect) costs were significantly higher whereas medicine (i.e. direct) costs significantly lower among users accessing P medicines on prescription compared to those buying them over-the-counter. While users accessing prescription P medicines faced lower out-of-pocket monetary costs, the overall value of the resources they consumed in accessing their P medicine were significantly higher when the opportunity cost of their time was included.

5.3 User time and resource costs – were any groups disadvantaged?

Mean user costs might be expected to differ between different groups of people. T – tests and ANOVA analyses were thus conducted, investigating potential differences between people with differing: demographic and socio-economic characteristics; self-reported health status; access to and use of primary care services; and types of medicines. The results are summarised in tables 5.3 – 5.16 below. These results were broadly replicated across the follow-up sample (n=717), as well as for time and resource cost estimates including special arrangement costs (see tables A5.12 – A5.14 in Appendix 5 for further details. Those results that changed, either moving into or out of significance are highlighted in bold).

Four main user cost categories were investigated and are reported below: (1) total time costs; (2) total mean costs; (3) travel and time; and (4) medicine costs.

TABLE 5.3: USER TIME COSTS BY DEMOGRAPHIC CHARACTERISTICS (N=1185)

Variable	N	Mean (minutes)	t or F	p-value	95% CI of Difference	
					Lower	Upper
Gender						
Male	440	21	-.179	.858	-11	10
Female	745	21				
Ethnic Group						
White	1170	21	.179	.858	-10	18
Non-white	15	27				
Age Band						
< 16 years	150	22	3.069	.003	19	26
16-19	29	18			12	24
20-29	123	21			17	25
30-39	188	19			16	23
40-49	175	18			15	21
50-59	169	24			15	21
60-69	181	25			21	28
70+	170	21			22	29
Marital Status						
Married	581	20	2.153	.045	19	22
Living with partner	35	20			12	28
Widowed	116	22			19	26
Divorced	72	24			18	30
Separated	22	34			19	48
Single, never married	216	20			17	22
N/A child	143	23			19	26

TABLE 5.4: USER RESOURCE COSTS BY DEMOGRAPHIC CHARACTERISTICS (N=1185)

Demographic Variable	Cost Variable	N	Mean (£)	T or F	p-value	95% CI of Difference	
						Lower	Upper
Gender							
Male	**Total**	440	6.12	-.169	.866	-0.4571	0.3847
Female		745	6.16				
Male	**Time &**	440	3.16	.596	.552	-0.23	0.42
Female	**Travel**	745	3.06				
Male		440	2.96	-0.725	.469	-0.50	0.23
Female	**Medicine**	745	3.10				
Ethnic Group							
White	**Total**	1170	6.13	-1.362	.174	-3.0789	0.5562
Non-white		15	7.38				
White	**Time &**	1170	3.08	-1.68	.093	-2.59	0.20
Non-white	**Travel**	15	4.28				
White		1170	3.05	-0.081	.935	-1.64	1.51
Non-white	**Medicine**	15	3.11				
Age Band							
< 16 years		150	5.45	4.839	.000	5.09	5.82
16-19		29	5.89			4.71	7.08
20-29		123	6.58			5.95	7.21
30-39	**Total**	188	6.52			5.97	7.08
40-49		175	6.52			5.93	7.12
50-59		169	6.95			6.28	7.63
60-69		181	5.78			5.32	6.24
70+		170	5.24			4.81	5.68
< 16 years		150	3.21	2.843	.006	2.79	3.63
16-19		29	2.67			1.90	3.43
20-29	**Time &**	123	3.03			2.55	3.51
30-39	**Travel**	188	2.85			2.42	3.27
40-49		175	2.70			2.33	3.07
50-59		169	2.79			2.41	3.17
60-69		181	3.49			3.09	3.90
70+		170	3.68			3.21	4.14
< 16 years		150	2.24	16.292	.000	1.96	2.53
16-19		29	3.23			1.87	4.59
20-29		123	3.55			2.96	4.14
30-39	**Medicine**	188	3.68			3.25	4.11
40-49		175	3.82			3.32	4.32
50-59		169	4.16			3.56	4.77
60-69		181	2.28			1.89	2.68
70+		170	1.57			1.29	1.84

Marital Status							
Married		581	6.39	4.576	.000	6.08	6.71
Live with partner		35	6.81			5.48	8.14
Widowed		116	5.27			4.73	5.81
Divorced		72	6.24			5.53	6.96
Separated	**Total**	22	8.57			6.22	10.92
Single, never married		216	6.00			5.54	6.47
N/A child		143	5.45			5.08	5.83
Married		581	3.07	2.284	.034	2.85	3.29
Live with partner		35	2.76			1.81	3.71
Widowed		116	3.20			2.72	3.68
Divorced		72	3.41			2.66	4.15
Separated	**Time &**	22	4.79			2.73	6.86
Single, never married	**Travel**	216	2.77			2.42	3.13
N/A child		143	3.27			2.83	3.71
Married		581	3.33	5.722	.000	3.05	3.60
Live with partner		35	4.05			2.89	5.20
Widowed		116	2.07			1.59	2.54
Divorced	**Medicine**	72	2.83			2.32	3.35
Separated		22	3.78			2.01	5.55
Single, never married		216	3.23			2.83	3.63
N/A child		143	2.19			1.90	2.47

5.3.1 User time and resource costs by demographic characteristics

5.3.1.1 Gender and ethnicity

Time and resource costs faced by users were broadly similar regardless of either gender or ethnicity. No statistically significant differences existed.

5.3.1.2 Age band

Statistically significant differences in mean user time costs by age band did exist, although no clear trend emerged. Children (<16 years) and older adults (50+ years) appeared to incur higher mean time costs.

Trends in both mean total and mean medicine costs mirrored expected patterns. Users in working age groups (16-59 years) incurred costs either similar to or greater than the overall sample average; whereas users outwith usual working age ranges (who also tended to fall within the age groups exempt from prescription charges (i.e. <19 years and > 60 years) faced lower than average costs. Older users (60+ years) incurred greater than sample average time and travel costs. Differences in both constituent and total user costs by age band were statistically significant across the majority of estimates.

5.3.1.3 Marital status

Statistically significant differences in mean user time costs were identified by marital status. Divorced or separated users appeared to incur higher mean time costs.

Statistically significant differences also emerged in mean total and constituent money costs between marital status groups, in both the full and follow-up samples. Clear trends did not, however, emerge.

TABLE 5.5: USER TIME COSTS BY SOCIO-ECONOMIC CHARACTERISTICS (N=1185)

Variable	N	Mean (minutes)	t or F	p-value	95% CI of Difference	
					Lower	Upper
Accommodation						
Mortgage/loan	481	17	7.541	.000	15	19
Owned outright	301	20			18	22
Local authority	246	28			25	31
Housing association	70	29			23	34
Privately furnished	40	20			12	27
Privately unfurnished	20	23			12	35
From employer	5	14			-4	32
Other, with payment	10	30			9	51
Rent free	12	25			10	40
Deprivation Category*						
Affluent (1)	88	17	4.047	.001	13	20
Affluent (2)	205	13			12	15
Average (3)	208	21			18	23
Average (4)	382	20			18	22
Deprived (5)	157	31			27	36
Deprived (6)	3	23			-7	55
Deprived (7)	30	30			23	36
Access to a Car or Van						
Yes	843	19	-6.39	.000	-11	-5
No	342	27				
Employment Category						
Paid work f/t	377	16	7.937	.000	14	17
Paid work p/t	112	19			16	22
Gvmt. training scheme	1	10			N/A	N/A
Retired	329	24			22	27
Unemployed	45	31			23	39
Disabled/perm. Sick	52	32			26	38
Caring for home/family	66	21			15	26
F/t education	124	22			18	26
Something else	79	23			18	27
Age Completed f/t Education						
Still in f/t education	193	21	4.284	.014	18	24
< 18 years	801	22			21	23
> 18 years	191	17			14	20

*Note: categories (1)-(7) refer to the Carstairs deprivation classification applied to Lothian Health postcodes

TABLE 5.6: USER RESOURCE COSTS BY SOCIO-ECONOMIC CHARACTERISTICS (N=1185)

Demographic Variable	Cost Variable	N	Mean (£)	t or F	p-value	95% CI of Difference	
						Lower	Upper
Accommodation							
Mortgage/loan		481	6.54	1.917	.054	6.19	6.88
Owned outright		301	5.90			5.51	6.29
Local authority		246	5.82			5.43	6.21
Housing assoc.		70	5.32			4.72	5.92
Privately furn.	**Total**	40	6.60			5.28	7.92
Private unfurn.		20	6.35			4.44	8.26
From employer		5	4.36			1.94	6.78
Other, paid		10	6.52			3.50	9.53
Rent free		12	6.49			4.15	8.83
Mortgage/loan		481	2.69	4.25	.000	2.48	2.90
Owned outright		301	3.02			2.71	3.33
Local authority		246	3.80			3.42	4.18
Housing assoc.		70	3.71			3.00	4.42
Privately furn.		40	2.77			1.81	3.74
Private unfurn.	**Time &**	20	3.11			1.73	4.49
From employer	**Travel**	5	2.32			-0.58	5.22
Other, paid		10	4.09			1.45	6.73
Rent free		12	3.73			1.21	6.26
Mortgage/loan		481	3.85			3.56	4.14
Owned outright		301	2.88			2.54	3.22
Local authority		246	2.02			1.69	2.35
Housing assoc.		70	1.61			1.20	2.03
Privately furn.		40	3.83			2.70	4.95
Private unfurn.		20	3.24			1.64	4.85
From employer		5	2.04			-0.36	4.44
Other, paid		10	2.43			0.50	4.35
Rent free		12	2.76			1.73	3.78

Demographic Variable	Cost Variable	N	Mean (£)	t or F	p-value	95% CI of Difference	
						Lower	Upper
Deprivation Category							
Affluent (1)	**Total**	88	5.95	2.111	.050	5.33	6.58
Affluent (2)		205	5.77			5.30	6.25
Average (3)		208	6.03			5.56	6.50
Average (4)		382	6.14			5.77	6.51
Deprived (5)		157	6.76			6.14	7.38
Deprived (6)		3	7.27			-0.70	15.24
Deprived (7)		30	4.67			3.99	5.36
Affluent (1)	**Time & Travel**	88	2.71	12.456	.000	2.18	3.25
Affluent (2)		205	2.08			1.84	2.31
Average (3)		208	3.10			2.76	3.44
Average (4)		382	2.94			2.68	3.20
Deprived (5)		157	4.28			3.77	4.79
Deprived (6)		3	5.47			1.94	8.99
Deprived (7)		30	3.78			2.95	4.61
Affluent (1)	**Medicine**	88	3.14	5.181	.000	2.76	3.71
Affluent (2)		205	3.69			3.26	4.13
Average (3)		208	2.93			2.56	3.30
Average (4)		382	3.20			2.86	3.54
Deprived (5)		157	2.48			1.97	2.98
Deprived (6)		3	1.80			-5.94	9.54
Deprived (7)		30	0.89			0.27	1.51
Access to a Car or Van							
Yes	**Total**	843	6.29	2.193	.029	0.05	0.95
No		342	5.79				
Yes	**Time & Travel**	843	2.89	-4.13	.000	-1.06	-0.38
No		342	3.61				
Yes	**Medicine**	843	3.40	6.278	.000	0.84	1.60
No		342	2.18				

*Note: categories (1)-(7) refer to the Carstairs deprivation classification applied to Lothian Health postcodes

Demographic Variable	Cost Variable	N	Mean (£)	t or F	p-value	95% CI of Difference	
						Lower	Upper
Employment Category							
Paid work f/t	**Total**	377	6.79	4.192	.000	6.36	7.23
Paid work p/t		112	6.13			5.52	6.74
Gvmt. scheme		1	5.45			N/A	N/A
Retired		329	5.57			5.22	5.91
Unemployed		45	5.71			4.83	6.59
Disabled/sick		52	5.87			5.21	6.52
Care for home		66	7.32			6.25	8.38
F/t education		124	5.64			5.18	6.10
Else		79	5.71			5.11	6.32
Paid work f/t	**Time & Travel**	377	2.44	6.484	.000	2.20	2.68
Paid work p/t		112	2.91			2.47	3.35
Gvmt. scheme		1	1.20			N/A	N/A
Retired		329	3.52			3.20	3.84
Unemployed		45	4.15			3.15	5.16
Disabled/sick		52	4.44			3.69	5.20
Care for home		66	2.99			2.29	3.68
F/t education		124	3.19			2.71	3.67
Else		79	3.18			2.57	3.79
Paid work f/t	**Medicine**	377	4.35	20.634	.000	3.99	4.71
Paid work p/t		112	3.22			2.79	3.65
Gvmt. scheme		1	4.25			NA	N/A
Retired		329	2.04			1.78	2.31
Unemployed		45	1.56			0.91	2.21
Disabled/sick		52	1.42			0.86	1.98
Care for home		66	4.33			3.23	5.42
F/t education		124	2.45			2.05	2.85
Else		79	2.53			2.13	2.93
Age Completed f/t Education							
Still f/t educ.	**Total**	193	5.60	3.084	.046	5.24	5.96
< 18 years		801	6.20			5.94	6.46
> 18 years		191	6.46			5.93	6.99
Still f/t educ.	**Time & Travel**	193	3.10	4.08	0.17	2.72	3.47
< 18 years		801	3.22			3.02	3.41
> 18 years		191	2.59			2.23	2.94
Still f/t educ.	**Medicine**	193	2.51	10.13	.000	2.21	2.81
< 18 years		801	2.98			2.75	3.21
> 18 years		191	3.87			3.44	4.30

5.3.2 User time and resource costs by socio-economic characteristics

5.3.2.1 Accommodation

Statistically significant differences emerged in both time and resource costs according to users' accommodation type, although patterns were difficult to discern. However, users resident in accommodation rented either from a local authority or housing association appeared to incur considerably higher mean time costs.

T-tests investigating differences in mean costs between homeowners and renters indicated that homeowners incurred higher mean total and medicine costs and lower time and travel costs compared to users who rented their home. These results were statistically significant.

5.3.2.2 Deprivation category

A monotonic relationship existed between mean user time costs and the levels of deprivation associated with the area in which users lived. As level of deprivation of the area within which a user lived increased, so too did their mean time costs to access P medicines. Differences were statistically significant.

Total mean cost faced by users generally increased alongside level of deprivation of the area in which they lived. The exception to this was for users resident in the most deprived areas who incurred lower total mean costs than the overall sample average. These trends were broadly replicated within the follow-up sample. These, differences were, however, statistically significant in the full sample only.

A clear trend existed between the deprivation category within which users were resident and the time and travel costs they incurred. Monotonic relationships existed between deprivation category and time and travel costs. As deprivation increased, users' time

and travel costs increased and vice versa. These differences were significant in both the full and follow-up samples.

A statistically significant inverse relationship existed between mean medicine costs faced by users and level of deprivation of the area in which they lived. As deprivation level decreased, mean medicine costs increased and vice versa.

5.3.2.3 Access to a car or van

Users without access to a car or van incurred significantly higher time costs.

Users with access to a car or van incurred higher mean total and mean medicine costs. However, the opposite result occurred regarding time and travel costs; users with access to a car or van faced lower time and travel costs than those without access to a car or van. Identified differences were statistically significant for all estimates and samples, except one (mean total costs in the follow-up sample).

5.3.2.4 Employment category

Statistically significant differences in user time costs were also evident, contingent upon users' employment category. Unemployed and disabled or permanently sick users incurred higher mean time costs.

Mean total and medicine costs appeared higher for users in full-time paid work and for those caring for a home or family and lower among the retired, unemployed and disabled users. However, the opposite trend occurred concerning user time and travel costs. Users in full-time paid work incurred lower than sample average travel and time costs; whereas the retired, unemployed and disabled users incurred higher than average time and travel costs. Again, identified differences were statistically significant across all samples.

5.3.2.5 Level of full-time education

Users who completed their full time education at over 18 years of age incurred lower mean time costs compared to other groups. Differences between groups were statistically significant.

Mean total and medicine costs were lower than the overall sample average for users still in full-time education; approximately equal to the sample average for users who completed their full-time education at <18yrs; and greater than the sample average for users who completed their full-time education at >18 years.

Trends in user travel and time costs differed to those for mean total and medicine costs. Users still in full-time education incurred travel and time costs close to the overall sample average; whereas those users who completed their full time education at <18 years incurred higher than average travel and time costs; compared to users completing their full-time education at >18 years. These differences were statistically significant for all estimates and samples, except one (mean total costs in the follow-up sample).

TABLE 5.7: USER TIME COSTS BY SELF-REPORTED HEALTH STATUS (N=1185)

Variable	N	Mean (minutes)	T or F	p-value	95% CI of Difference	
					Lower	Upper
General Health Status						
Very good	290	17	16.407	.000	15	19
Good	595	20			18	21
Fair	253	26			23	28
Bad	36	42			31	53
Very bad	11	33			17	49
Longstanding Illness						
Yes	436	26	5.967	.000	5	10
No	749	18				

TABLE 5.8: USER RESOURCE COSTS BY SELF-REPORTED HEALTH STATUS (N=1185)

Variable	Cost Variable	N	Mean (£)	T or F	p-value	95% CI of Difference	
						Lower	Upper
General Health Status							
Very good		290	6.00	2.038	.087	5.64	6.37
Good		595	6.12			5.84	6.40
Fair	**Total**	253	6.16			5.67	6.65
Bad		36	7.72			6.24	9.21
Very bad		11	5.35			2.90	7.80
Very good		290	2.65	14.631	.000	2.36	2.93
Good		595	2.88			2.68	3.08
Fair	**Time & Travel**	253	3.71			3.33	4.09
Bad		36	5.51			4.15	6.87
Very bad		11	4.73			2.15	7.30
Very good		290	3.36	3.410	.009	3.06	3.65
Good		595	3.24			2.99	3.50
Fair	**Medicine**	253	2.45			2.04	2.86
Bad		36	2.22			0.98	3.45
Very bad		11	0.62			-0.13	1.38
Longstanding Illness							
Yes	**Total**	436	5.93	-1.556	.120	-0.76	0.09
No		749	6.27				
Yes	**Time &Travel**	436	3.71	5.98	.000	0.65	1.29
No		749	2.74				
Yes	**Medicine**	436	2.22	-6.001	.000	-1.89	-0.96
No		749	3.53				

5.3.3 User time and resource costs by self-reported health status

5.3.3.1 General health status

A statistically significant inverse relationship existed between self-reported general health status and mean user time costs. As users' self-reported general health status decreased, mean user time costs increased.

No statistically significant differences in user total mean costs were identified according to user self-reported general health status in either the full or follow-up samples. Statistically significant differences were, however, identified in constituent time and travel and medicine costs.

Users reporting very good or good health incurred lower, whereas users reporting either fair or bad to very bad general health incurred higher travel and time costs. Mean medicine costs moved in the opposite direction. Users reporting either very good or good health status incurred higher medicine costs than those reporting bad to very bad general health. This general trend was replicated in the follow-up sample, however, the differences were not statistically significant.

5.3.3.2 Presence of a longstanding illness

Users reporting the presence of a longstanding illness incurred significantly higher mean time costs than those who did not.

Users reporting no longstanding illness incurred higher mean total costs, although these differences were not statistically significant. Statistically significant differences did, however, exist in travel and time and medicine costs and moved in opposite directions. Users with longstanding illnesses incurred higher mean travel and time costs but lower mean medicine costs compared to users without a longstanding illness.

TABLE 5.9: USER TIME COSTS BY USE OF GENERAL PRACTICE AND COMMUNITY PHARMACY SERVICES (N=1185)

Variable	N	Mean (minutes)	t or F	p-value	95% CI of Difference	
					Lower	Upper
No. of General Practitioner Consultation in the Last Year						
Not at all	124	12	18.883	.000	10-14	14
Once or twice	503	19			17-21	21
3-5 times	291	22			19-24	24
6-10 times	188	27			24-31	31
> 10 times	79	33			28-39	39
No. of Community Pharmacy Consultation in the Last Year						
Not at all	264	32	29.442	.000	29	36
Once or twice	313	21			19	23
3-5 times	443	16			15	17
6-10 times	149	17			14	20
> 10 times	16	17			10	25
Use the Same Community Pharmacy Regularly						
Yes	1023	22	2.338	.020	1	8
No	162	18				
Regular Prescription Medicines						
Yes	572	25	5.983	.000	5	10
No	613	18				

TABLE 5.10: USER RESOURCE COSTS BY USE OF GENERAL PRACTICE AND COMMUNITY PHARMACY SERVICES (N=1185)

Variable	Cost Variable	N	Mean (£)	t or F	p-value	95% CI of Difference	
						Lower	Upper
No. Of General Practitioner Consultation in the Last Year							
Not at all	**Total**	124	5.79	.661	.619	5.18	6.40
Once or twice		503	6.24			5.92	6.55
3-5 times		291	6.08			5.70	6.46
6-10 times		188	6.34			5.74	6.93
> 10 times		79	5.88			5.22	6.54
Not at all	**Time & Travel**	124	1.94	17.069	.000	1.64	2.24
Once or twice		503	2.84			2.61	3.06
3-5 times		291	3.15			2.82	3.47
6-10 times		188	3.82			3.38	4.25
> 10 times		79	4.65			3.93	5.37
Not at all	**Medicine**	124	3.85	12.508	.000	3.28	4.43
Once or twice		503	3.40			3.14	3.66
3-5 times		291	2.93			2.59	3.27
6-10 times		188	2.51			2.02	3.02
> 10 times		79	1.23			0.81	1.66
No. of Community Pharmacy Consultation in the Last Year							
Not at all	**Total**	264	6.50	1.101	.355	6.02	6.98
Once or twice		313	6.05			5.67	6.43
3-5 times		443	5.95			5.65	6.26
6-10 times		149	6.21			5.57	6.85
> 10 times		16	6.58			4.29	8.86
Not at all	**Time & Travel**	264	5.66	24.125	.000	4.02	4.87
Once or twice		313	3.91			2.74	3.34
3-5 times		443	3.25			2.32	2.69
6-10 times		149	3.35			2.18	3.01
> 10 times		16	3.83			1.86	3.96
Not at all	**Medicine**	264	2.06	10.462	.000	1.69	2.42
Once or twice		313	3.01			2.69	3.34
3-5 times		443	3.45			3.18	3.72
6-10 times		149	3.62			3.05	4.18
> 10 times		16	3.67			1.25	6.10
Use the Same Community Pharmacy Regularly							
Yes	**Total**	1023	6.11	-.793	.428	-0.83	0.35
No		162	6.35				
Yes	**Time & Travel**	1023	3.16	2.063	.039	0.02	0.93
No		162	2.68				
Yes	**Medicine**	1023	2.95	-2.757	.006	-1.23	-0.21
No		162	3.66				
Regular Prescription Medicines							
Yes	**Total**	572	6.10	-.444	.657	-0.50	0.31
No		613	6.18				
Yes	**Time & Travel**	572	3.58	6.013	.000	0.64	1.25
No		613	2.64				
Yes	**Medicine**	572	2.51	-5.864	.000	-1.38	-0.69
No		613	3.55				

5.3.4 Time and resource costs by use of general practice and community pharmacy services

5.3.4.1 Number of general practice consultations

A statistically significant monotonic relationship existed between mean user time costs and the number of visits to the general practitioner in the last year. As the number of general practitioner consultations increased, so too did mean user time costs.

No statistically significant differences existed between total mean user costs and the number of general practitioner consultations attended by users in the last year, in either the full or follow-up samples. Significant differences were, however, identified in mean time and travel. Infrequent general practitioner attenders (0-2 visits) incurred lower, and frequent attenders (6+ visits) higher, time and travel costs than the overall sample average.

Mean medicine costs were also significantly different between infrequent and frequent general practitioner attenders. Again, they moved in the opposite direction to time and travel costs. Frequent general practitioner attenders incurred lower and infrequent general practitioner attenders higher mean medicine costs than the overall sample average.

5.3.4.2 Number of community pharmacist consultations

Users who had not consulted a community pharmacist in the last year faced significantly higher mean time costs compared to those that had.

No statistically significant differences were identified in total mean user costs and the number of visits made by users to community pharmacists in the last year.

Statistically significant differences did exist in mean time and travel and medicine costs in both full and follow-up samples. Users who had not consulted the community pharmacist at all in the last year incurred higher than average mean time and travel costs, compared to users who had consulted the community pharmacist more often. Again mean medicine costs moved in the opposite direction, in that they were lower among users who had never consulted the community pharmacist, compared to those that had consulted the community pharmacist more frequently.

5.3.4.3 Use of the same community pharmacist regularly

Users who visited the same community pharmacist regularly incurred significantly higher mean time costs compared to those that did not.

No statistically significant differences existed in the total mean user costs incurred by users depending on whether they used the same community pharmacist regularly or not.

Users who used the same community pharmacist regularly incurred significantly higher mean time and travel costs (full sample only). Whereas, mean medicine costs were significantly higher among users who did not use the same community pharmacist regularly, in both full and follow-up samples.

5.3.4.4 Receipt of regular prescription medicines

Users in receipt of regular prescription medicines incurred significantly higher mean time costs compared to those not in receipt of regular prescription medicines.

No statistically significant differences were identified in total mean user costs contingent upon whether users were in receipt of regular prescription medicines.

Mean travel and time costs were significantly higher for users in receipt of regular prescription medicines. In contrast, mean medicine costs were significantly higher for users not in receipt of regular prescription medicines. These results held in both full and follow-up samples.

TABLE 5.11: USER TIME COSTS BY ACCESS TO GENERAL PRACTICE AND COMMUNITY PHARMACY SERVICES (N=1185)

Variable	N	Mean (minutes)	t or F	p-value	95% CI of Difference	
					Lower	Upper
Usual Wait to See General Practitioner						
Same day	233	22	1.661	.127	20	24
Following day	172	20			16	23
2 days	196	23			20	27
3-5 days	237	21			18	24
1 week	262	20			17	22
1-2 weeks	74	25			19	31
> 2 weeks	11	11			5	18
Distance to General Practitioner Surgery						
Under a mile	541	24	4.303	.002	22	26
1-2 miles	515	19			17	20
3-4 miles	89	21			17	26
5-10 miles	34	17			11	23
> 10 miles	6	22			-13	57
Distance to Community Pharmacy						
Under a mile	763	21	.308	.873	0	130
1-2 miles	337	21			5	100
3-4 miles	60	22			5	100
5-10 miles	20	21			5	75
> 10 miles	5	30			10	90

TABLE 5.12: USER RESOURCE COSTS BY ACCESS TO GENERAL PRACTICE AND COMMUNITY PHARMACY SERVICES (N=1185)

Variable	Cost Variable	N	Mean (£)	t or F	p-value	95% CI of Difference	
						Lower	Upper
Usual Wait to See General Practitioner							
Same day		233	5.64	3.056	.006	5.30	5.98
Following day		172	6.16			5.62	6.71
2 days		196	6.26			5.78	6.75
3-5 days		237	6.87			6.32	7.42
1 week	**Total**	262	5.89			5.46	6.33
1-2 weeks		74	6.15			5.32	6.99
> 2 weeks		11	4.54			3.00	6.09
Same day		233	3.11	1.47	.185	2.78	3.43
Following day		172	2.85			2.46	3.25
2 days		196	3.45			3.02	3.88
3-5 days		237	3.08			2.71	3.45
1 week	**Time & Travel**	262	2.95			2.66	3.23
1-2 weeks		74	3.44			2.63	4.25
> 2 weeks		11	1.87			0.75	2.99
Same day		233	2.54	3.993	.001	2.24	2.83
Following day		172	3.31			2.83	3.79
2 days		196	2.81			2.43	3.20
3-5 days		237	3.78			3.31	4.26
1 week	**Medicine**	262	2.95			2.56	3.34
1-2 weeks		74	2.71			2.06	3.36
> 2 weeks		11	2.67			1.51	3.84
Distance to General Practice Surgery							
Under a mile		541	6.14	.616	.651	5.83	6.44
1-2 miles		515	6.04			5.75	6.32
3-4 miles		89	6.58			5.58	7.59
5-10 miles	**Total**	34	6.46			5.34	7.59
> 10 miles		6	7.07			2.46	11.67
Under a mile		541	3.31	2.131	.075	3.07	3.55
1-2 miles		515	2.84			2.62	3.07
3-4 miles		89	3.30			2.66	3.95
5-10 miles	**Time & Travel**	34	2.87			2.00	3.73
> 10 miles		6	3.53			-1.12	8.19
Under a mile		541	2.83	1.408	.229	2.55	3.10
1-2 miles		515	3.19			2.95	3.44
3-4 miles		89	3.28			2.55	4.00
5-10 miles	**Medicine**	34	3.60			2.61	4.58
> 10 miles		6	3.54			1.83	5.25
Distance to Community Pharmacy							
Under a mile		763	5.89	3.092	.015	5.64	6.13

1-2 miles		337	6.63			6.23	7.03
3-4 miles		60	6.71			5.60	7.82
5-10 miles	**Total**	20	5.81			4.58	7.03
> 10 miles		5	7.08			1.75	12.40
Under a mile		763	2.97	1.311	.264	2.78	3.17
1-2 miles		337	3.27			2.98	3.56
3-4 miles		60	3.52			2.83	4.22
5-10 miles	**Time & Travel**	20	3.41			2.28	4.53
> 10 miles		5	4.07			-1.21	9.35
Under a mile		763	2.91	1.482	.205	2.70	3.13
1-2 miles		337	3.36			3.01	3.71
3-4 miles		60	3.19			2.34	4.03
5-10 miles	**Medicine**	20	2.40			1.74	3.06
> 10 miles		5	3.00			1.73	4.28

5.3.5 User time and resource costs by access to general practice and community pharmacy services

5.3.5.1 Usual wait to see the general practitioner

There were no statistically significant differences in mean user time costs and usual wait to see a general practitioner.

Significant differences in total mean user costs existed depending on how long users usually waited to see the general practitioner. However, the trends in the data were not clear.

5.3.5.2 Distance to the general practitioner

Statistically significant differences did emerge in mean user time costs and distance to the general practitioner, although no clear trend emerged.

No statistically significant difference existed in user travel and time costs and the distance to the users general practitioner surgery.

5.3.5.3 Distance to the community pharmacist

There were no statistically significant differences in mean user time costs and distance to the community pharmacist.

Significant differences in total mean user costs were identified according to the distance users travelled to the community pharmacist. Users travelling over a mile to their local community pharmacist incurred higher total mean costs overall. However, no statistically significant differences were identified in either mean travel and time or medicine costs by distance to the community pharmacist.

TABLE 5.13: USER TIME COSTS BY COST OF MEDICINES (N=1185)

Variable	N	Mean (minutes)	t or F	p-value	95% CI of Difference	
					Lower	Upper
Exempt from Prescription Charge						
Yes	679	26	-9.37	.000	-13	-9
No	506	15				
Put Off by Cost of Medicines						
Yes	187	30	6.305	.000	7	14
No	998	19				

TABLE 5.14: USER RESOURCE COSTS BY COST OF MEDICINES (N=1185)

Variable	Cost Variable	N	Mean (£)	t or F	p-value	95% CI of Difference	
						Lower	Upper
Exempt from Prescription Charge							
Yes	**Total**	506	6.85	5.984	.000	0.83	1.64
No		679	5.62				
Yes	**Time & Travel**	506	2.32	-8.63	.000	-1.66	-1.04
No		679	3.67				
Yes	**Medicine**	506	4.53	15.668	.000	2.26	2.91
No		679	1.94				
Put Off by Cost of Medicines							
Yes	**Total**	187	6.56	1.752	.080	-0.06	1.05
No		998	6.06				
Yes	**Time & Travel**	187	4.03	5.138	.000	0.69	1.54
No		998	2.92				
Yes	**Medicine**	187	2.53	-2.504	.012	-1.10	-0.13
No		998	3.14				

5.3.6 Time and resource costs by cost of medicines

5.3.6.1 Exemption from prescription charges

Users exempt from prescription charges incurred significantly higher mean time costs.

Mean total and medicine costs were significantly higher for users who were eligible to pay for prescription medicines. Whereas, travel and time costs were significantly higher for users who were exempt from paying prescription charges.

5.3.6.2 Put off obtaining medicines due to their cost

Users who reported having been put off obtaining medicines in the past because of their cost exhibited significantly higher mean time costs.

Total mean user costs were higher among users who reported having been put off obtaining medicines in the past, in both the full and follow-up samples. However, these differences in mean costs between the groups were not statistically significant.

Significantly higher time and travel costs were identified among users who reported having been put off accessing medicines in the past due to their cost in both the full and follow-up samples.

Mean medicine costs were significantly higher among users who reported never having been put off obtaining medicines due to their cost (full sample only).

TABLE 5.15: USER TIME COSTS BY TYPE OF MEDICINES (N=1185)

Variable	N	Mean (minutes)	t or F	p-value	95% CI of Difference	
					Lower	Upper
Deregulated (POM to P)						
Yes	492	20	-	.349	-4	1
No	693	22	.937			
NHS Blacklisted						
Yes	512	16	-	.000	-12	17
No	673	25	7.87			

TABLE 5.16: USER RESOURCE COSTS BY TYPE OF MEDICINES (N=1185)

Variable	Cost Variable	N	Mean (£)	t or F	p-value	95% CI of Difference	
						Lower	Upper
Deregulated (POM to P)							
Yes	**Total**	492	6.97	6.846	.000	1.01	1.82
No		693	5.56				
Yes	**Time & Travel**	492	3.03	-	.486	-0.43	0.20
No		693	3.14	0.697			
Yes	**Medicine**	492	3.94	8.64	.000	1.18	1.87
No		693	2.41				
NHS Blacklisted							
Yes	**Total**	512	5.75	-	.001	-1.10	-0.28
No		673	6.44	3.307			
Yes	**Time & Travel**	512	2.45	-	.000	-1.45	-0.83
No		673	3.59	7.237			
Yes	**Medicine**	512	3.30	2.500	.013	0.10	0.81
No		673	2.85				

5.3.7 User time and resource costs by type of medicines

5.3.7.1 Deregulated medicines

User time costs were not significantly impacted depending on whether users were accessing a deregulated medicine (switched from POM to P status) or a regular P class medicine.

However, statistically significant differences emerged in mean total and medicine costs incurred by users, depending on the type of P medicine obtained, in both full and follow-up samples. Users accessing a P medicine recently deregulated from POM (prescription only medicine) to P (pharmacy available) status incurred significantly higher total mean costs than those who were accessing medicines available over-the-counter for some time.

There were no statistically significant differences in mean travel and time costs to users according to the deregulated status of the P medicine accessed.

5.3.7.2 NHS blacklisted medicines

Users accessing P medicine(s) blacklisted from the NHS prescribing list, incurred significantly lower mean time costs.

Users obtaining medicines blacklisted from the NHS prescribing list incurred significantly lower mean total and travel and time costs than users who obtained non-blacklisted P medicines. Mean medicine costs faced by users obtaining NHS blacklisted medicines were, however, higher (although this difference was significant in the full sample only).

5.4 Average time and resource costs accruing to stakeholders across various access routes

Tables 5.17 and 5.18 below focus on the sample for which there is follow-up data (n=718) and summarise the actual (average) time and resource costs accruing to stakeholders across varied access routes, including both initial and follow-up visits (if any).

TABLE 5.17: ACTUAL (AVERAGE) TIME COSTS (MINUTES) ACCRUING TO STAKEHOLDERS ACROSS VARIED ACCESS ROUTES (N=718)

User access route		N	User Time Cost	General Practitioner Time Cost	Community Pharmacy Time Cost	Total Time Cost
Initial Visit	Follow-up Visit					
CP	None	418	13	0	1	**14**
CP	CP	39	33	0	2	**35**
GP	None	134	40	9	4	**53**
GP	CP	5	57	8	5	**70**
CP	GP	76	76	14	5	**95**
GP	GP	46	120	22	8	**150**

TABLE 5.18: ACTUAL (AVERAGE) RESOURCE COSTS (£) ACCRUING TO STAKEHOLDERS ACROSS VARIED ACCESS ROUTES (N=718)

User access route		N	User Cost	General Practitioner Cost	Community Pharmacy Cost	Total Cost
Initial Visit	Follow-up Visit					
CP	None	418	5.77	0.00	0.45	**6.22**
CP	CP	39	14.69	0.00	1.19	**15.88**
GP	None	134	6.49	11.12	14.35	**31.96**
GP	CP	5	12.60	10.00	9.49	**32.09**
CP	GP	76	17.93	17.60	12.57	**48.10**
GP	GP	46	17.51	27.48	28.20	**73.19**

Total average time and resource costs associated with accessing P class medicines are generally lower to all concerned when users visited a community pharmacy first to access P medicines (14 to 95 minutes and £6.22 to £48.10). As soon as the general practitioner is involved, both time and resource costs go up appreciably (53 to 150 minutes and £31.96 to £73.19). (For a summary of low and high resource cost estimates, see table A5.16 in Appendix 5).

Total mean time and resource costs were broadly similar for estimates of complete access routes i.e. including both initial and follow-up costs as they were for estimates of the individual initial and follow-up (if any) visits accruing to stakeholders. More detailed time and resource cost estimates (alongside summary statistics) for the complete access routes are presented in tables A5.15 and A5.17 respectively in Appendix 5.

5.5 Proportional time and resource costs incurred by stakeholders across varied access routes

It is useful to consider the burden of total time and resource costs incurred by stakeholder groups across different access routes and how they might change in the event of changes in policy. Tables 5.19 and 5.20 break down the proportion of total time and resource costs incurred by stakeholder groups. Tables A5.18 to A5.23 in Appendix 5 present the proportional breakdown of time and resource costs, both including and excluding user special arrangement costs, alongside more detail concerning the proportions of total time and resource costs by key constituent elements.

TABLE 5.19: PROPORTIONAL TIME COSTS (MINUTES) ACCRUING TO STAKEHOLDERS ACROSS VARIED ACCESS ROUTES

Initial & Follow-Up Visits	
Stakeholder	**% Excluding Special Arrangements**
User	83
General practitioner	11
Community pharmacist	6
Initial Visit Only	
Stakeholder	**% Excluding Special Arrangements**
User	84
General practitioner	9
Community pharmacist	7
Follow-Up Visit Only	
Stakeholder	**% Excluding Special Arrangements**
User	81
General practitioner	15
Community pharmacist	4
First Visit: P medicine on Rx in General Practitioner Appointment (n=176)	
Stakeholder	**% Excluding Special Arrangements**
User	77
General practitioner	17
Community pharmacist	6
First Visit: P Medicine on Repeat Rx from General Practitioner (n=127)	
Stakeholder	**% Excluding Special Arrangements**
User	76
General practitioner	14
Community pharmacist	10
First Visit: P Medicine Bought OTC at Community Pharmacy (n=882)	
Stakeholder	**% Excluding Special Arrangements**
User	93
General practitioner	-
Community pharmacist	7
Follow-up Visit: General Practitioner Appointment (n=122)	
Stakeholder	**% Excluding Special Arrangements**
User	80
General practitioner	15
Community pharmacist	5
Follow-up Visit: Community Pharmacy (n=44)	
Stakeholder	**% Excluding Special Arrangements**
User	94
General practitioner	-
Community pharmacist	6

TABLE 5.20: PROPORTIONAL RESOURCE COSTS (£) ACCRUING TO STAKEHOLDERS ACROSS VARIED ACCESS ROUTES

Initial & Follow-Up Visits	
Stakeholder	**% Excluding Spec. Arr.**
User	41
General Practitioner	27
Community Pharmacist	32
Initial Visit Only	
Stakeholder	**% Excluding Spec. Arr.**
User	46
General Practitioner	23
Community Pharmacist	31
Follow-Up Visit Only	
Stakeholder	**% Excluding Spec. Arr.**
User	23
General Practitioner	43
Community Pharmacist	33
First Visit: P Medicine on Rx in General Practitioner Appointment (n=176)	
Stakeholder	**% Excluding Spec. Arr.**
User	18
General Practitioner	43
Community Pharmacist	39
First Visit: P Medicine on Repeat Rx from General Practitioner (n=127)	
Stakeholder	**% Excluding Spec. Arr.**
User	18
General Practitioner	24
Community Pharmacist	57
First Visit: P Medicine Bought OTC at Community Pharmacy (n=882)	
Stakeholder	**% Excluding Spec. Arr.**
User	93
General Practitioner	-
Community Pharmacist	7
Follow-Visit: General Practitioner Appointment (n=122)	
Stakeholder	**% Excluding Spec. Arr.**
User	18
General Practitioner	47
Community Pharmacist	35
Follow-Up Visit: Community Pharmacy Consultation (n=44)	
Stakeholder	**% Excluding Spec. Arr.**
User	94
General Practitioner	-
Community Pharmacist	6

5.5.1 Proportion of total time and resource costs incurred by stakeholders across varied access routes

Users incurred the vast majority of time costs, bearing over four-fifths (81-84%) of the total time costs associated with accessing P medicines in initial and follow-up access routes. By comparison, general practitioners contributed between 9-15% of total time expended and community pharmacists 4-7%.

Resource costs were more evenly distributed between stakeholders. Users absorbed between around a quarter to a half (23-46%) of total resource costs; general practitioners between a quarter and two-fifths (23-43%); and community pharmacists around a third (31-33%) overall.

These trends in the proportional breakdown of total stakeholder time and resource costs were broadly replicated both in estimates including users special arrangement costs and when aggregated across both initial and follow-up access routes (see tables A5.18 and A5.20 in Appendix 5).

These proportions differed, depending on whether user access routes involved general practitioners or community pharmacists primarily. Users incurred the vast majority of both time and resource costs, 93-94%, in routes involving a community pharmacist primarily, compared to between 76-80% of time and 18% of resource costs in access routes involving mainly a general practitioner.

Clearly, access routes involving user visits to a general practitioner accounted for total general practitioner time costs (9-15%). General practitioner resource costs translated into between just under a quarter (24%) of total resource costs when P medicines were obtained through repeat prescription mechanisms, to just under a half (43-47%) when they were obtained within a general practitioner appointment.

The proportion of total time costs consumed by community pharmacist activities were broadly similar across different access routes, ranging between 5-10% of total time costs in those primarily with the general practitioner, compared to 6-7% in consultation primarily with the community pharmacist. The proportion of total resource costs incurred by community pharmacists ranged from around a third (35-39%) if the prescription was obtained in a recent general practitioner appointment to approximately three-fifths (57%) if obtained through repeat prescription systems. The proportion of total costs incurred by community pharmacists in over-the-counter sales was very small in comparison, at between 6-7% only.

5.5.2 Proportional breakdown of total costs across stakeholders by constituent elements

Because of the amount of data, the proportion of total time and resource costs incurred by users, broken down by the constituent elements of their varied access routes to P medicines (both including and excluding special arrangement time costs) are summarised in tables A5.19 and A5.21 in Appendix 5. The following summarises key findings regarding how stakeholder time was expended across the different access routes. Waiting times were the most important factor differentiating user time costs. They were between two to four times greater for users accessing medicines on prescription from a general practitioner, compared to users buying them over-the-counter from a community pharmacy.

5.5.2.1 Key cost drivers

The proportion of total resource costs incurred by users, general practitioners and community pharmacists, broken down by the main constituent elements of varied access routes to P medicines are summarised in table A5.21 – A5.23 in Appendix 5.

Users

Waiting and travel time accounted for approximately two-thirds (57-69%) of total costs accruing to users accessing their P medicine on prescription; compared to only a quarter (26-28%) of total costs to users who bought their P medicine over-the-counter at a community pharmacy.

Time spent consulting professionals represented 14-18% of total costs among those who attended a general practitioner appointment; compared to between only 0-2% of total costs faced by community pharmacy users.

Travel costs comprised a greater share of total user costs among those visiting the general practitioner (8-19%) compared to those visiting the community pharmacy.

Travel costs among users accessing P medicines through repeat prescription mechanisms were double those associated with other access routes.

Medicine costs represented between a tenth to a quarter (11-23%) of total user costs in access routes involving a general practitioner; compared to around two-thirds (64-67%) in community pharmacy access routes.

In summary, the drivers of total user cost depended on the access route adopted. Where P medicines were accessed on prescription from a general practitioner, the key drivers of user costs were travel and waiting time; whereas medicine cost was the most significant cost element among users buying P medicines from a community pharmacy.

General practitioners

General practitioner time consumed between 52 – 68% of total general practitioner costs where users actually had an appointment with the general practitioner. When P medicine(s) were obtained on a repeat prescription, general practitioner time costs associated with administering and signing repeat prescriptions accounted for between nearly a third (29%) and a half (45%) of total general practitioner costs.

Net ingredient cost (NIC) of medicines constituted between approximately a third (32%) and a half (48%) of total general practitioner costs when medicines were obtained during an appointment. Medicines obtained on repeat prescriptions cost between just over half (55%) and nearly three quarters (71%) of total general practitioner costs.

In summary, general practitioner time was the key driver of total general practitioner costs within appointments, whereas the cost of medicines were the main cost driver within repeat prescription access routes.

Community pharmacy

When P medicines were obtained by users on prescription, time spent dispensing prescriptions accounted for between a fifth (19%) and a half (51%) of total costs to community pharmacists.

Time spent by community pharmacists giving advice on P medicines obtained on prescription constituted a negligible proportion of total cost to community pharmacists, ranging between 1% and 4%. On-cost allowances paid to community pharmacists represent between a quarter (28%) and half (50%) of the total costs to community pharmacy and dispensing fees between approximately a fifth (18%) and a third (30%). Where users bought P medicines over-the-counter, 100% of costs to the community pharmacist were associated with giving advice on over-the-counter medicines purchased.

In summary, there were three key drivers of total community pharmacist costs – community pharmacist time, on-cost allowances and dispensing fee payments. Time spent by the community pharmacist giving advice was the exclusive driver of costs in over-the-counter sales. Time costs constituted a substantial proportion of total costs to community pharmacy when P medicines were obtained through prescription routes, specifically dispensing time. On-cost allowances and dispensing fees paid to community pharmacists were also major drivers of total costs to community pharmacy.

5.6 Consumer surplus analyses

5.6.1 Who wins or loses by switching access routes?

Consumers' surplus analysis investigates the net consumption benefits (or costs) resulting if users switched their chosen access route to the alternate one available (e.g. if those users who visited a general practitioner to access their P medicine on prescription had, instead, visited the community pharmacy and bought their medicine over-the-counter, and vice-versa). It considers the impact of any changes in time and resource costs faced by users, and at the same time, it elucidates the changing distribution of costs across stakeholders, identifying the 'winners' and 'losers' among stakeholders as a result of such switches.

Changing time and resource costs accruing to stakeholders were estimated by applying actual and modelled cost estimates (sensitised at the individual level to account for factors affecting process e.g. prescription exemption status) to work out the differences in costs resulting had users chosen to adopt the alternate access route available to them. Change in stakeholder time and resource costs were, therefore, calculated as the difference between the time and resource costs actually incurred associated with the access route adopted by users minus the average time and resource costs to stakeholders associated with the alternate access route.

Summary results of the consumer surplus analyses are presented in tables 5.21 and 5.22 below. A table outlining low and high modelled resource cost estimates is presented in table A5.24 in Appendix 5.

TABLE 5.21: MODELLED TIME SAVINGS ACCRUING TO STAKEHOLDERS WHEN USERS SWITCHED THEIR INITIAL ACCESS ROUTE TO THE ALTERNATE ONE

Time savings: switching from general practice* to community pharmacy access routes (n=303)		
Stakeholder/ Perspective	**Total time saving (hours)**	**Ave. time saving per user (minutes)**
User	162	32
General practitioner	45	9
Community pharmacist	14	3
Society	**221**	**44**
Time costs: switching from community pharmacy to general practice* access routes (n=882)		
Stakeholder/ Perspective	**Total time cost (hours)**	**Ave. time cost per user (minutes)**
User	-310	-21
General practitioner	-132	-9
Community pharmacist	-41	-3
Society	**-483**	**-33**

* The costs calculated for general practice access routes were derived from a proportional combination of those associated with accessing P medicines during a GP appointment and those associated with obtaining a repeat prescription via a GP.

TABLE 5.22: MODELLED RESOURCE SAVINGS ACCRUING TO STAKEHOLDERS WHEN USERS SWITCHED THEIR INITIAL ACCESS ROUTE TO THE ALTERNATE ONE

Resource savings: switching from general practice* to community pharmacy access routes (n=303)		
Stakeholder/ Perspective	**Total resource savings (£)**	**Ave. resource saving/user (£)**
User	18	0.06
General practitioner	3422	11.29
Community pharmacist	4179	13.79
Society	**7619**	**25.14**
Resource savings: switching from community pharmacy to general practice* access routes (n=882)		
Stakeholder/ Perspective	**Total resource costs (£)**	**Ave. resource cost/user (£)**
User	-2888	-3.27
General practitioner	-9371	-10.62
Community pharmacist	-12291	-13.94
Society	**-24550**	**-27.83**

* The costs calculated for general practice access routes were derived from a proportional combination of those associated with accessing P medicines during a GP appointment and those associated with obtaining a repeat prescription via a GP.

Had all users who obtained their P medicine on prescription from a general practitioner (N=303) gone to the community pharmacy first instead, this would have this would have saved them an average of 32 minutes each and a total of 162 hours (124 hours attending appointments and 38 hours obtaining repeat prescriptions). This translated into average and total user resource savings of £0.06 each and £18 respectively. Further, 45 hours and £3422 of general practitioner time and resources would have been saved (representing between 270-386 general practitioner consultation slots of between 7-10 minutes) and 14 hours and £4179 of community pharmacist time and resources. Total saving in societal time and resource costs as a result of this switch would be 221 hours and £7619.

Reorientation of demand and consultation patterns associated with the general practitioner to community pharmacist switches outlined above would engender a win-win situation, with stakeholder groups (and perspectives) benefiting overall as a result of reduced average time and resource costs. However, resource savings from this switch swing heavily towards the health sector, with users only very marginally better off, on average.

The vast majority of users 96% (292/303) within the sample who obtained a prescription for their P medicine from a general practitioner, would have been winners, facing lower time costs had they switched their access route and visited the community pharmacist instead to buy their P medicine over-the-counter; for 3% (9/303) users there was no difference in time cost to them between the two alternate access routes; and 1% (2/303) of users would have been worse off incurring higher time costs if they had switched.

In contrast, however, the majority of users 55% within the sample who adopted a general practitioner first access route would have been financial losers, facing higher money costs had they switched their initial access route and visited the community pharmacist instead to buy their P medicine over-the-counter.

The health sector would also have benefited from the switch, with 59 hours of professional time and £7601 of resources freed for alternate uses (45 hours of general practitioner time and £3422 of resources and 14 hours of community pharmacist time and £4179 of resources).

For every 1000 users buying P medicines from the community pharmacy as opposed to obtaining them on prescription from general practitioners, 533 hours of user time and £60 of resources, 200 hours of health sector time and £25080 of resources – 150 hours and £11290 of general practitioner time and resources (representing between 900-1286 general practitioner consultation slots) and 50 hours and £13790 of community pharmacist time and resources – and 733 hours and £25140 of societal time and resources would be saved overall.

Had those users who visited the community pharmacy first (n=882) attended a general practitioner appointment instead, this would have cost them an extra 21 minutes on average and a total of 310 hours. This translated into extra average and total user resource costs of £3.27 each and £2888 respectively. Further, an additional 132 hours and £9371of general practitioner time and resources (representing between 792-1131 general practitioner consultation slots) and 41 hours and £12291 of community pharmacist time and resources would have been required to deal with these users accessing P medicines via prescription routes. Total additional costs incurred by society as a result of this switch would be 483 hours and £24550.

Reorientation of demand and consultation patterns associated with the community pharmacist to general practitioner switch outlined above would engender a lose-lose situation, with stakeholder groups (and perspectives) losing out overall, as a result of increased average time and resource costs.

The vast majority of users 92% (815/882) within the sample who bought their P medicine over-the-counter at a community pharmacy would have been losers, incurring extra time costs, had they switched their access route and visited the general practitioner instead to obtain a prescription for their P medicine; for 1% of users (9/882) there was no difference in time cost to them between the alternate routes; however, 7% of users (58/882) would have saved time had they accessed their P medicine on prescription obtained from a general practitioner.

The vast majority of users 83% within the sample who adopted a community pharmacy first access route, buying their P medicine over-the-counter at a community pharmacist, would have been losers, incurring extra costs, had they switched their access route and visited the general practitioner instead to obtain a prescription for their P medicine.

The health sector would also have incurred extra costs as a result of such a switch, with an additional 173 hours and £21662 of professional time and resources required to meet the demand for P medicines on prescription (132 and £9371 hours of general practitioner time and resources and 41 hours and £12291 of community pharmacist time and resources).

For every 1000 users accessing P medicines from general practitioners as opposed to from community pharmacies, 350 extra hours and £3270 of user time and resources and 200 extra hours and £24560 of health sector time and resources – 150 hours and £10620 of general practitioner time and resources (representing between 900-1286 general practitioner consultation slots) and 50 hours and £13940 of community pharmacist time and resources – and 550 extra hours and £27830 of societal time and resource costs would have been incurred.

5.7 Time and resource cost implications of changes to policy on accessing to P medicines

The next stage of the analyses was to undertake simple modelling exercises, comparing the impact on net benefits to stakeholders (and perspectives) resulting from a range of potential changes in policy in relation to access to and provision of P class medicines. Included are: the resource consequences of status quo arrangements and the effect on resources if users switched the route through which they access P medicines; costs of accessing P medicines from general practitioners exclusively; making P class medicines accessed routinely via repeat prescription mechanisms available from community pharmacies direct (with a sub-scenario investigating the implication of paying community pharmacists a fee for providing this service); and making P class medicines available only from community pharmacies (with a sub scenario investigating the implication of both paying community pharmacists a fee to provide this service and requiring users not exempt from prescription charges to contribute to the costs of their medicines via a user charge).

The scenarios modelled considered modifications to the status quo policy situation one at a time. Ideally, it would have also been useful to consider simultaneous changes to the access routes. Unfortunately, time pressures meant that this was not possible. This is an area for future research efforts.

Analyses are summarised in tables 5.23 – 5.24. These were then compared to the actual time and resource cost consequences resulting from the consultation patterns identified within the study sample. Differences between actual and modelled time costs for the study sample are highlighted, alongside benchmark estimates per 1000 users as a reference source for both policy analyses and future research. Time costs are reported, with the total value of all resources expended in brackets.

Table 5.1 summarised the average time, and table 5.2 the average resource, costs incurred by stakeholders across each and both of the initial and follow-up routes adopted

to access P medicines. Tables 5.23 and 5.24 extrapolate these estimates, modelling the time costs that would have accrued to stakeholders and perspectives if users in the study sample (n=1185) had adopted access routes consistent with the various policy scenarios outlined above.

TABLE 5.23: CHANGING TIME COSTS TO STAKEHOLDERS AND PERSPECTIVES ASSOCIATED WITH VARIOUS POLICY SCENARIOS FOR MANAGING THE PROVISION OF AND ACCESS TO P MEDICINES

Stakeholder	Actual Sample Time Cost (Hours)	Time Cost Per 1000 Users (Hours)	Modelled Sample Time Cost Under Policy Scenario (Hours)	Difference Between Modelled & Actual Sample Time Cost (Hours)	Difference Between Modelled & Actual Sample Time Cost Per 1000 Users (Hours)
Policy Scenario 1: Time costs of the status quo arrangements for the provision of and access to P medicines					
Initial Visit					
Total Time - User	**417** [a]	**352**	N/A	N/A	N/A
Total Time - Health Sector	**80** [a]	**68**	N/A	N/A	N/A
Total Time - Society	**497** [a]	**420**	N/A	N/A	N/A
Policy Scenario 2: P medicines available only via prescriptions obtained during an appointment with a general practitioner					
Total Time - User	**153** [c]	**867**	**1027**	**610**	**515**
Total Time - Health Sector	**46** [c]	**267**	**316**	**236**	**199**
Total Time - Society	**199** [c]	**1134**	**1343**	**846**	**714**
Policy Scenario 3: P medicines routinely obtained on repeat prescription available direct from community pharmacy					
Total Time - User	**60** [d]	**467**	**553**	**136**	**234**
Total Time - Health Sector	**19** [d]	**150**	**178**	**98**	**83**
Total Time – Society	**79** [d]	**617**	**731**	**234**	**317**
Policy Scenario 4: P Medicines available only from community pharmacies over-the-counter					
Total Time - User	**204** [e]	**233**	**277**	**-140**	**-119**
Total Time - Health Sector	**15** [e]	**17**	**20**	**-60**	**-51**
Total Time – Society	**219** [e]	**250**	**297**	**-200**	**-170**

User Perspective = User Cost
Health Sector Perspective = General Practitioner Cost + Community Pharmacist Cost
Societal Perspective = User Cost + General Practitioner Cost + Community Pharmacist Cost

[a] time cost estimates derived from total cost for full sample across all initial access routes (n=1185)
[c] time cost estimates derived from cost for users in the sample accessing their P medicine on prescription during a general practitioner appointment (n=176)
[d] time cost estimates derived from cost for users in the sample accessing their P medicine on repeat prescription from a general practitioner (n=127)
[e] time cost estimates derived from cost for user in the sample accessing their P medicine over-the-counter from a community pharmacy (n=882)

TABLE 5.24: CHANGING RESOURCE COSTS TO STAKEHOLDERS AND PERSPECTIVES ASSOCIATED WITH VARIOUS POLICY SCENARIOS FOR MANAGING THE PROVISION OF AND ACCESS TO P MEDICINES

Stakeholder	Actual Sample Resource Cost (£)	Resource Cost Per 1000 Users (£)	Modelled Sample Resource Cost Under Policy Scenario (£)	Difference Between Modelled & Actual Sample Resource Cost (£)	Difference Between Modelled & Actual Sample Resource Cost Per 1000 Users (£)
Policy Scenario 1: Resource (£) consequences of the status quo arrangements for the provision of and access to P medicines					
Initial Visit					
Total Resources - User	**6997** [a]	**5905**	N/A	N/A	N/A
Total Resources - Health Sector	**8134** [a]	**6864**	N/A	N/A	N/A
Total Resources – Society	**15131** [a]	**12769**	N/A	N/A	N/A
Policy Scenario 2: P medicines available only via prescriptions obtained during an appointment with a general practitioner					
Total Resources - User	**1081** [c]	**6140**	**7276**	**279**	**235**
Total Resources - Health Sector	**4973** [c]	**28260**	**33488**	**25354**	**21396**
Total Resources – Society	**6054** [c]	**34400**	**40764**	**25633**	**21631**
Policy Scenario 3: P medicines routinely obtained on repeat prescription available direct from community pharmacy					
Total Resources - User	**620** [d]	**4880**	**5783**	**-1214**	**2440**
Total Resources - Health Sector	**2764** [d]	**21760**	**25786**	**17652**	**6480**
Total Resources – Society	**3384** [d]	**26640**	**31569**	**16438**	**8920**
Policy Scenario 4: P Medicines available only from community pharmacies over-the-counter					
Total Resources - User	**5296** [e]	**6000**	**7110**	**113**	**95**
Total Resources - Health Sector	**397** [e]	**450**	**533**	**-7601**	**-6414**
Total Resources – Society	**5693** [e]	**6450**	**7643**	**-7488**	**-6319**

User Perspective = User Cost
Health Sector Perspective = General Practitioner Cost + Community Pharmacist Cost
Societal Perspective = User Cost + General Practitioner Cost + Community Pharmacist Cost

[a] resource cost estimates derived from total cost for full sample across all initial access routes (n=1185)
[c] resource cost estimates derived from cost for users in the sample accessing their P medicine on prescription during a general practitioner appointment (n=176)
[d] resource cost estimates derived from cost for users in the sample accessing their P medicine on repeat prescription from a general practitioner (n=127)
[e] resource cost estimates derived from cost for user in the sample accessing their P medicine over-the-counter from a community pharmacy (n=882)

5.7.1 Policy Scenario 1: Time and resource cost of status quo arrangements for the provision of and access to P class medicines

5.7.1.1 Time and resource costs

Total societal costs accruing across both initial and follow-up visits was 682 hours and £19718 of resources (497 hours/£15131 in initial and 185 hours/£4587 in follow-up visits). This comprised 566 hours/£8070 of user time (417 hours/£6997 in initial and 149 hours/£1073 in follow-up visits); 73 hours/£5410 of general practitioner time (46 hours/£3422 in initial and 27 hours/£1988 in follow-up visits); and 43 hours/£6238 of community pharmacists' time (34 hours/£4712 in initial and 9 hours/£1526 in follow-up visits).

A 1000 users accessing P medicines via a similar pattern of initial access routes would consume 352 hours (£5905) of their own time, 39 hours (£2888) of general practitioner time, 29 hours (£3976) of community pharmacy time and 420 hours (£12769) overall.

5.7.2 Policy Scenario 2: P medicines available only via prescriptions obtained during an appointment with a general practitioner

5.7.2.1 Time and resource costs

If sample users had all attended a general practitioner appointment to obtain their P medicine on prescription: user time costs would have more than doubled (to 1027 hours) taking up an extra 610 hours of users time, or an extra 31 minutes per user, on average. However, the actual money costs incurred by users would increase only marginally, by an extra £0.24 per user, on average. Health sector time costs would have almost quadrupled (to 316 hours), consuming an extra 236 hours and £ 25354 in resources (191 hours (£14080) of general practitioner time and 45 hours (£11274) of community pharmacy time), representing between 1146 and 1637 extra general practitioner consultation slots (of between 7-10 minutes duration). Societal time costs would have almost tripled (to 1343 hours), costing an extra 846 hours overall, while total resource costs would increase by a factor of 2.5 to £40764. This represents a lose-lose situation both for society overall, as well as for the constituent stakeholders, in that all their time and resource costs would increase, although only marginally for users.

Per 1000 users accessing P medicines on prescription during a general practitioner appointment compared to the access routes actually adopted by sample users under the status quo policy arrangements, all stakeholder time costs would increase: user time costs by 515 hours and £235 (or an extra 31 minutes each, on average); general practitioners by 161 hours and £11882 (representing between 966 – 1380 extra general practitioner consultation slots at between 7-10 minutes each); community pharmacy by 38 hours (£9514); and total societal costs by 714 hours (£21631).

5.7.3 Policy Scenario 3: Repeat prescription P medicines available direct from the community pharmacy

5.7.3.1 Time and resource costs

If, compared to the actual access patterns adopted, the 127 users who accessed their P medicine via repeat prescription mechanisms through general practices had been able instead to obtain them direct, over-the-counter from community pharmacies: user time costs would have fallen by a half (to 30 hours), saving 30 hours, or an average of 14 minutes per user. Users' monetary costs would have decreased by half to £310, or an average saving of £2.44 per user. General practitioner time costs would have been reduced, saving 11 hours, potentially freeing up between 64-91 general practitioner consultation slots (of between 7-10 minutes duration). Consequently, health sector resource costs would be reduced, saving £823. Societal time costs would have decreased by 41 hours overall and resource costs decreased, saving £1133 in resources overall.

Per 1000 users, accessing repeat prescription P medicines over-the-counter from a community pharmacy, as opposed to through general practice, would save 234 hours of user time (or an average of 14 minutes each) and half user costs by £2440. 83 hours (£6480) of general practitioner time, representing between 498-711 general practitioner slots (of between 7-10 minutes duration) would be saved. It is unlikely that any community pharmacy resources (time or medicine costs) would be saved under this scenario, as the pharmacist would still be required to dispense the repeat prescription medicines and offer advice as normal. A total of 317 hours and £8920 would be saved overall.

Accessing repeat prescription medicines over-the-counter from community pharmacies, as opposed to through general practice repeat prescription systems, potentially represents a win-win situation for society overall, as well as for the constituent stakeholders, in that time costs seem likely to decrease (for general practitioners and users) or remain the same (in community pharmacy). Total societal costs would decrease overall and general

practice resources potentially freed up for alternate uses. The impact on community pharmacy resources is, however, less clear. Given that pharmacists would have been dispensing these repeat prescriptions anyway, it is tempting to consider this scenario to be resource neutral for community pharmacy. However, it is difficult to conclude this with any certainty.

5.7.4 Policy Scenario 3a: Repeat prescription P medicines available direct from the community pharmacy, with community pharmacies explicitly remunerated for providing this service

Note: this scenario is a derivative of scenario 3, outlined previously.

5.7.4.1 Time and resource costs

If, compared to the actual access patterns adopted, the 127 users who accessed their P medicine via repeat prescription mechanisms through general practices had been able to obtain them direct, from community pharmacies, with pharmacies explicitly remunerated for providing this service (at various rates between £1.50, £2.00 and £2.50), then user and general practitioner outcomes would be identical to those outlined in scenario 3 above.

However, explicitly remunerating community pharmacies (between £1.50 to £2.50) to offer advice on the use of the P medicines concerned would increase costs in community pharmacy by between £191 and £318. This would, however, be offset against savings in general practice resources (of £823) and result in a net saving of between £632 and £505 to the health sector overall.

Assuming an increase in advice giving and administration time within community pharmacies of between 1 to 3 minutes to deal with this new role, time costs to community pharmacy would increase between approximately 2 to 6 hours. Societal time and resource costs would still, however, decrease overall, by between 35 to 39 hours and £815 to £942 respectively.

Per 1000 users, 234 hours and £2440 and 83 hours and £6480 of user and general practitioner time and resources would be released, as before. Time and money costs in community pharmacies would increase by between 17 to 50 hours and £1500 to £2500 respectively. Overall, between 267 and 300 hours and £6420 and £7420 of societal costs would still be saved after remunerating community pharmacies to provide this service.

Enabling users to access repeat prescriptions for P medicines direct from community pharmacies, via a system in which pharmacies were remunerated for this service, potentially represents a win-win situation for society overall, as well as to the constituent stakeholders. One would expect time and resource costs to decrease for users and general practitioners and remain relatively constant in community pharmacies. However, the development, regulation and administration of such a service is likely to have an impact on the organisation and running of community pharmacies. However, this could be accommodated if community pharmacies were explicitly remunerated as outlined. Even after remuneration, resource savings could potentially be released, relative to the status quo provision of services.

5.7.5 Policy Scenario 4: P medicines only available over-the-counter from community pharmacies

5.7.5.1 Time and resource costs

If, compared to the actual access patterns adopted, all users had opted to obtain their P medicine by buying it over-the-counter at a community pharmacist: user time costs would have fallen by a third (to 277 hours), saving 140 hours, or an average of 7 minutes per user. However, user monetary costs would have increased slightly, costing £113 more, or an extra £0.10 per user, on average. Health sector time costs would have been reduced by three-quarters (to 20 hours) and £7601 of resources freed for alternate uses (46 hours (£3422) of general practitioner time potentially, freeing up between 276 and 394 general practitioner consultation slots, and 14 hours (£4179) of community pharmacy time). Societal time costs would have almost halved (to 297 hours (£7643)) saving 200 hours (£7488) overall.

Per 1000 users buying P medicines over-the-counter from the community pharmacy, rather than the routes adopted by sample users under the status quo policy arrangements, user time costs would decrease by 119 hours (7 minutes each, on average) and resource costs increased slightly (£95). However, 39 hours (£2888) of general practitioner time (representing between an 234 – 334 extra general practitioner consultation slots at between 7-10 minutes each), and 12 hours (£3526) community pharmacy time would be freed up for alternate uses. Total societal time costs would be reduced by 170 hours (£6319).

Compared to the actual time costs incurred across the initial access routes actually adopted by users in this study to obtain P medicines, accessing them over-the-counter from a community pharmacist represents a win-win situation both for society overall, as well as for the constituent stakeholders, in that all their time costs would decrease if users routinely accessed their P medicines in this way. However, costs faced by users would increase slightly (on average), although considerable health sector and societal resources would be released as a consequence.

5.7.6 Policy Scenario 4a: P medicines only available over-the-counter from community pharmacies, with community pharmacists explicitly remunerated to provide this service and users contributing via user charges depending on their prescription exemption status.

Note: this scenario is a derivative of scenario 4 outlined previously.

5.7.6.1 Time and resource costs

If, compared to the actual access patterns adopted, all users had obtained their P medicine over-the-counter at a community pharmacy, with pharmacists explicitly remunerated for providing this service and users contributing to the cost of obtaining their P medicine, depending on their prescription exemption status, user time and general practitioner time and money costs would be identical to those outlined in scenario 4 above.

Assuming the same proportion of prescription exempt (57%) and non-exempt (43%) users as in the study sample, with the former group able to access their medicines free as before and the latter contributing to the cost of their medicines (at either the equivalent of the prescription fee £5.80 or at the average sample cost for over-the-counter medicines of £3.84) then users would have incurred additional money costs of £2958 and £1958 respectively.

Assuming advice giving and administration time costs for this scheme of between 1 to 3 minutes; a fee paid to pharmacists between £1.50 and £2.50; and that user contributions are deducted from the costs of the medicines provided, community pharmacy time and resource costs would be as follows:

Time costs to community pharmacies would decrease by 14 hours if they spent 1 minute per consultation but increase between 6 to 25 hours if they spent 2 or 3 minutes in each consultation. However, this scenario would still generate savings in societal time costs of between 175, 194 and 214 hours overall.

Fee payments to community pharmacy would be between £1778, £2370 and £2963. Assuming average medicine costs of between £5.80, £8.74 and £11.00 for the P medicines provided, then medicine costs would range between £6873, £10357 and £13035 respectively. After accounting for user contributions to the costs of these medicines, based on their prescription exemption status and applying a user charge of £5.80 to users not exempt from prescription charges, these costs would decline to £3915, £7399 and £10077. Assuming that the non-exempt users paid the lower average price paid by users for over-the-counter medicines (£3.84) then the cost of the medicines under this scheme would be £4915, £8399 and £11077. In total, community pharmacy costs in this scenario would range between £5693, £9709 and £13040 (applying a £5.80 user charge) and between £6693, £10769 and £14040 (applying the £3.84 user charge). Community pharmacy costs in this scenario would increase by between £981, £4997, £8328 and between £1981, £6057, £9328 respectively. These extra costs would, however, be partially offset by the savings in general practice cost of £3422.

Applying the low cost estimates, between £3704 and £4704 would be saved in societal resources overall under this scenario. At the mid estimates, this scenario could either slightly decrease (by £128) or increase (by £872) societal costs overall. Applying the high cost estimates, societal costs would increase overall between £3643 and £4643.

Per 1000 users in this scenario, user time and general practitioner time and money costs would again be identical to those outlined in scenario 4 above.

Users would have incurred additional costs for medicines of between £1651 and £2494. Time costs to community pharmacies would decrease by 12 hours if they spent 1 minute per consultation but increase between 4 to 21 hours if they spent 2 or 3 minutes in each consultation. There would still, however, be savings in societal time costs of between 148, 165 and 181 hours overall.

Fee payments to community pharmacy would be between £1500, £2000 and £2500. Medicine costs would range between £5800, £8740 and £11000 respectively. After accounting for user contributions to the costs of these medicines, these costs would decline to between £3306, £6246, £8506 and £4149, £7089 and £9349 (if £5.80 or £3.84 was recovered in user charges from those not exempt from prescription charges). In total, community pharmacy costs in this scenario would range between £4806, £8246, £11006 and £5649, £9089 and £11849. Community pharmacy costs in this scenario would increase by between £826, £4226, £7026 and between £1669, £5109, £7869 respectively. These extra costs would, however, be partially offset by the savings in general practice cost of £3422.

Applying the low cost estimates, between £3130 and £3973 would be saved in societal resources overall under this scenario. At the mid estimates, this scenario could either slightly decrease (by £111) or increase (by £732) societal costs overall. Applying the high cost estimates, societal costs would increase overall between £3070 and £3913.

Compared to the actual time costs incurred across the initial access routes actually adopted by the users in this study to obtain P medicines, accessing them over-the-counter from a community pharmacist who is paid a fee for providing this service, alongside cost recovery via user charges represents a win-win situation for society overall. User costs would increase for medicines, probably because the user charges applied were higher than the money costs actually paid by users in the study for their medicines. The impact on societal resources was varied. At low cost and time estimates, societal resources were still released overall. However, when high time and cost estimates were applied, this situation was reversed and societal costs increased overall.

To this point in the analysis only partial economic evaluation has been conducted. This stage in the economic evaluation, although partial is still very useful, particularly as comprehensive cost estimates associated with accessing P class medicines within primary care (general practice and community pharmacy) settings have not, until now, existed. However, cost analysis, with its focus only on costs, while ignoring outcomes, is inadequate to address efficiency issues. For this reason, the next stage was to extend the analysis applying economic evaluation techniques – cost minimisation analysis (CMA) in particular.

5.8 Economic evaluation

5.8.1 Cost minimisation analysis

If we assume that health outcomes among populations using P class medicines to treat minor ailments are approximately equivalent – whether obtained from the general practitioner on prescription or over-the-counter from the community pharmacy during a supervised sale – then cost minimisation analysis is the economic evaluation method of choice, as it focuses on difference in cost only between rival alternatives, with the least costly alternative deemed to be the more efficient. Cost minimisation analyses are particularly useful for considering the distribution of costs and the extent to which they shift between interested parties.

Low, medium and high sample average costs per user accessing P medicines from either the general practitioner or community pharmacist first were summarised in table A5.16 in Appendix 5. Stakeholder costs per 1000 users visiting either the community pharmacist or general practitioner first to access their P medicine (with no subsequent follow-up visits to primary care services required) are summarised in table 5.25 below.

TABLE 5.25: AVERAGE COSTS (£) TO STAKEHOLDERS & PER 1000 USERS IN COMMUNITY PHARMACY FIRST AND GENERAL PRACTITIONER FIRST ACCESS ROUTED WITH NO FOLLOW-UP VISIT

Access Route		Average Sample Cost					Cost Per 1000 Users				
Initial	**Follow-Up**	**Cost Est.**	**User**	**GP**	**CP**	**Total**	**Cost Est.**	**User**	**GP**	**CP**	**Total**
Community Pharmacy	None	**Low**	4.76	0.00	0.16	4.92	**Low**	4760	0	160	4920
		Mid	5.77	0.00	0.45	6.22	**Mid**	5770	0	450	6220
		High	6.39	0.00	1.48	7.87	**High**	6390	0	1480	7870
General Practitioner	None	**Low**	3.77	7.37	13.50	24.64	**Low**	3770	7370	13500	24640
		Mid	6.49	11.12	14.35	31.96	**Mid**	6490	11120	14350	31960
		High	8.03	14.42	15.79	38.24	**High**	8030	14420	15790	38240

Total cost per 1000 users accessing their P medicine over-the-counter from a community pharmacist (with no subsequent follow-up visits to primary care services required) were £4920, £6220 and £7870, compared to total costs of £24,640, £31960 and £38240 (low, mid and high estimates respectively) for those accessing a P medicine on prescription

from a general practitioner (with no subsequent follow-up visits to primary care services required).

The table shows that cost minimisation analysis confirms that obtaining P medicines over-the-counter during a supervised sale from a community pharmacist is a more and efficient way to provide access to P medicines from all stakeholder perspectives (societal, health sector and user) costing around only a fifth of the general practitioner access route alternatives. The one exception was at low cost estimates for users, where it was cheaper (on average) for users to access their P medicine from the general practitioner.

It was also useful to compare the relative costs to stakeholders per 1000 users of accessing P medicines assuming that equivalent proportions of users required to make follow-up visits following their initial consultation with the general practitioner (28%) or community pharmacy (22%) to that within the study sample. These are outlined in table 5.26 below.

Table 5.26: COSTS (£) TO STAKEHOLDERS PER 1000 USERS ADOPTING COMMUNITY PHARMACY FIRST AND GENERAL PRACTITIONER FIRST ACCESS ROUTES, ASSUMING PROPORTIONAL FOLLOW-UP VISITS TO THAT IN THE STUDY SAMPLE

Consultation		N	Cost Est.	User	GP	CP	Total
Initial	Follow-Up						
CP	None	780	Low	3713	0	125	3838
			Mid	4501	0	351	4852
			High	4984	0	1154	6139
CP	CP	70	Low	858	0	43	898
			Mid	1028	0	83	1112
			High	1129	0	228	1357
CP	GP	150	Low	1898	1754	1830	5481
			Mid	2690	2640	1886	7215
			High	3140	3422	2061	8622
Total			**Low**	**6469**	**1754**	**1998**	**10221**
			Mid	**8219**	**2640**	**2320**	**13179**
			High	**9253**	**3422**	**3443**	**16118**
GP	None	720	Low	2714	5306	9720	17741
			Mid	4673	8006	10332	23011
			High	5782	10382	11369	27533
GP	CP	30	Low	262	199	251	712
			Mid	378	300	285	963
			High	443	389	359	1190
GP	GP	250	Low	2445	4560	6823	13828
			Mid	4378	6870	7050	18298
			High	5408	8903	7430	21740
Total			**Low**	**5421**	**10065**	**16828**	**32289**
			Mid	**9429**	**15176**	**17441**	**42272**
			High	**11633**	**19674**	**19165**	**50463**

Table 5.26 highlights that costs were almost exclusively lower, both from individual and collective stakeholder perspectives, when P medicines were accessed from community pharmacies under supervised sale arrangements.

In summary, the cost minimisation analysis confirmed that, from both individual and collective stakeholder perspectives, it was more efficient for P medicines to be accessed by visiting community pharmacies first. Importantly, this results held, even when allowing for any subsequent primary care follow-up visits to either the general practitioner or community pharmacy.

5.9 Comparisons with other economic analyses

Unfortunately, it was not possible to compare the results of this economic analysis with other literature estimates. To date, no economic evaluation of the policy encouraging increased self-medication using P class medicines bought from pharmacies (and the associated substitution between general practice and community pharmacists provoked as a result) have been conducted. Likewise, detailed analyses investigating the magnitude and distribution of costs incurred by stakeholders associated with this policy do not exist.

Average cost per consultation figures are presented in two recent UK studies investigating related issues (i.e. the Care at the Chemist and Direct Supply of Medicines schemes). However, the estimates are presented in isolation and the methods they adopted are not outlined, thus making any meaningful comparison impossible.

The economic data presented in this thesis, therefore, constitutes an important contribution in this regard. It initiates efforts to explore the economic implications and consequently, fuller appraisal this policy.

5.9 Summary of policy relevant results

BOX 5.1: TIME COSTS TO STAKEHOLDERS

- Total average time costs to all stakeholders ranged between 14-50 minutes, with an overall sample average of 47 minutes.
- Mean user time cost ranged between 14-68 minutes.
- A rule of halves applied to user time costs. Buying a P medicine took half as long (14-68 minutes on average) as obtaining them by repeat prescription (28 minutes), which took half as long as accessing them in a general practitioner consultation (52-68 minutes on average).
- Primary care professionals' time costs were much lower when users visited the community pharmacy. As soon as general practitioners were involved, time costs to primary care professionals rose considerably.

BOX 5.2: RESOURCE COSTS TO STAKEHOLDERS

- Total average resource costs to all stakeholders ranged from £6.56 to £82.82, with an overall sample average of £30.94.
- Mean monetary valuation of total resource costs expended by users across different access routes ranged between £4.88 and £7.17.
- Total average costs were significantly lower among users accessing P medicines via repeat prescriptions.
- Mean total costs were significantly higher among users accessing P medicines from general practitioners.
- User time and travel costs increased 100% across different access routes: by a factor of three and two in general practitioners' and repeat prescription routes respectively, compared to users who bought their P medicine at a community pharmacy.
- Accessing P medicines over-the-counter at a community pharmacy increased user monetary costs by between 2-7 times.
- Users accessing their P medicines on prescription from general practitioners incurred significantly higher resource costs overall, compared to those who bought them.
- Time and travel and medicine costs moved in opposite directions. Time and travel costs were significantly higher and medicine costs significantly lower among users accessing P medicine on prescription and vice versa for those who bought them from community pharmacies.
- Users accessing P medicines on prescription incurred lower out-of-pocket money expenditure. However, the overall value of the resources they expended accessing their P medicine was higher when the opportunity cost of their time was included.
- Resource costs to general practitioners issuing P medicines on prescription during a consultation were double those associated with issuing them by repeat prescription.
- Costs to community pharmacists increased appreciably when dispensing prescriptions for P medicines, compared to selling them over-the-counter.

BOX 5.3: WERE ANY USERS DISADVANTAGED?

- Status quo policy arrangements appear to increase time costs and disadvantage users: who reported less favourable socio-economic circumstances; who perceived themselves not to be in good health; and who were more frequent users of primary care.
- Total resource costs were higher among users whose socio-economic characteristics suggested they were more likely to be able to afford to bear higher costs and lower among those who were not.
- Time and travel costs were higher among those reporting less favourable socio-economic circumstances, who were more frequent users of primary care services, compared to those who were more affluent, in better health and who were less frequent users of primary care services.
- Medicine costs were higher among relatively more affluent users; those in better health; and less frequent users of primary care services. By comparison, less affluent users, those who reported poorer health and more frequent users of primary care services incurred lower medicine costs.
- In the context of current policy, opportunities to substitute may be limited for groups that feel it is cost prohibitive.

BOX 5.4: AVERAGE AND PROPORTIONAL SHARE OF COSTS TO STAKEHOLDERS

- Total average time and resource costs were generally lower when P medicines were bought in community pharmacies (14-95 minutes and £6.22 - £48.10).
- As soon as general practitioners are involved, both time and resource costs increase appreciably (53-150 minutes and £31.96 - £73.19).
- Users incurred the vast majority of time costs (81-84%) compared to general practitioners (9-15%) and community pharmacists (4-7%).
- Total resource costs were more evenly distributed, with users incurring between a quarter to a half (23-46%); general practitioners between a quarter to two-fifths (23-43%); and community pharmacists around a third (31%).
- Users incurred the vast majority of time and resource costs if they bought their P medicine over-the-counter at a community pharmacy (93-4%); whereas in General practitioner access routes, users incurred the majority of time (76-80%) but not resource costs (18%).
- Waiting time was the key difference in user time expended different routes. Waiting times were proportionally greater (2-4 times) in general practitioner access routes.
- Key drivers of user total resource costs were travel and waiting time in general practitioner routes but medicine costs in community pharmacy routes.
- General practitioner time was the key cost driver where P medicines were accessed on prescription.
- Community pharmacy faced three main cost drivers – time, on-cost allowances and dispensing fees.

BOX 5.5: IMPACT OF CHANGING POLICY SCENARIOS

- Sample users switching from general practitioners to community pharmacies to access P medicines would result in a win-win situation, with all stakeholders incurring savings overall. However resource savings would be skewed heavily to the health sector. Whilst on average users would be better off overall, over half of them would be worse off in terms of money costs.
- Accessing P medicines through repeat prescription mechanisms in community pharmacies would generate a win-win situation overall. Total societal costs would decrease. Health sector resources would be freed up for alternate uses. However, costs would be shifted to users, who would face increased costs, on average.
- P medicine available only to buy from community pharmacies would also result in a win-win situation overall. However, average monetary costs faced by users would increase. Considerable health sector resources would, however, be released.

BOX 5.6: RELATIVE EFFICIENCY OF ALTERNATE ROUTES TO ACCESS P MEDICINES

- Cost minimisation analysis confirmed that it is more efficient for P medicines to be accessed through community pharmacies, as opposed to through general practitioners. This result held, even when subsequent follow-up visits were allowed for.

Chapter 6:

Discussion

6.1 Introduction

The aim of this chapter is to synthesise and reflect on the findings of the research conducted in this thesis. It begins by outlining the limitations of the theory and method applied in the research. It then considers the relevance of the results to current policy debates, discussing the impact of encouraging increased self-medication using P medicines and associated substitution between primary care professionals. It then considers the winners and losers from the policy and concludes by identifying implications for future research.

6.2 Limitations of the study

The key pros and cons of the study design and analytical techniques, alongside justifications for the final choice of theory and methods adopted are outlined within the literature and method chapters. Policy evaluations are typically pragmatic. However, even in pragmatic evaluation it is important to have a clear understanding of the implications of the underlying theoretical underpinnings of the methods adopted and the potential implications of this for data generation, analysis and interpretation of results. This chapter starts by considering the appropriateness of the consumer surplus and economic evaluation methodologies applied in this study, highlighting potential implications in considering the results and their interpretation. Two key areas of limitation will be addressed: limitations of the theoretical foundations underpinning the methods adopted; and general limitations or weaknesses inherent within the research, as conducted.

6.2.1 Limitations of the theory and method

6.2.1.1 Consumers' surplus analysis

There are two main limitations in estimating consumers' surplus resulting from different routes, and thus prices, to access P medicines: first, uncertainty regarding the form of demand curves for P medicines; and second, limitations of demand analysis in explaining user behaviour

Uncertainty regarding the form of demand curves for P medicines

Key assumptions of neo-classical demand theory that underpin consumers' surplus analysis include: linear, additive demand functions; constant marginal utility of money; and the aggregation of individual consumer's surpluses.

The additivity assumption requires that the utility gained from consuming a P medicine is a function of the quantity of the commodity consumed, independently of the amount of other commodities consumed (Blaug, 1996). If this assumption is violated, the demand schedule may not be linear and thus consumers' surplus analysis will be based on an approximation, rather than actual, consumers' willingness to pay. If we know the demand curve for P medicines, this should not be a problem (Pearce, 1983). However, the UK P medicine market is relatively immature and in a state of flux, and the exact shape and nature of the demand curves for P medicines are uncertain. Ryan and Yule (1988) suggest, however, that because the maximum willingness to pay of individuals within large groups typically varies widely, it is reasonably safe to assume that demand schedules for P medicines broadly concur with the required linear additivity assumptions (Ryan and Yule, 1988). Nonetheless, the findings presented should be regarded as an approximate rather than an exact measure of consumers' surplus.

The assumption of constant marginal utility of income is necessary to ensure that a key factor influencing demand, i.e. income, is not changing (Blaug, 1996). This may be

assumed if the commodity concerned is 'unimportant', accounting for a negligible proportion of consumers' total purchases (Blaug, 1996; Pearse, 1983; Call and Holahan, 1994; Lipsey, 1987). If this is not so, then the approximation of consumers' surplus may be poor (Lipsey, 1987; Call and Holahan, 1983). Whether P medicines may be regarded as unimportant may vary depending on individuals' income and the absolute and relative price of P medicines obtained on prescription compared to those bought. P medicines may well have been 'unimportant' in terms of their price and impact on income to some users, however, this was unlikely to be the case for all users in the study. Indeed, differential time and money price sensitivities were identified among different groups of users, indicating that the 'unimportant commodity' assumption may not hold for all. However, the existence of the prescription exemption system should, in theory, ameliorate income impacts across users (albeit they are not directly income related or proportional to income).

Consumers' surplus analysis requires aggregation of surpluses across individuals to arrive at an aggregate estimate of benefit (Pearse, 1983). The placing of the apostrophe in consumers' surplus tacitly assumes interpersonal comparisons of utility, yet, individual consumer's surpluses may not be additive in this way. It is unlikely that all individuals experience identical marginal utility from money income (Blaug, 1996) and distributional considerations become relevant. Aggregated consumers' surplus estimates should, therefore, be interpreted with caution (Blaug, 1996). Care should be taken to consider both individual and group level surpluses and their distribution. These potential limitations of the application of consumer surplus analysis in this study were addressed by collecting proxy income data, identifying individual user costs, and explicitly considering distributional issues. This enabled consideration of not only sample average results, but also the impact to particular groups and even individual users, making it much easier to assess the distribution of benefits.

Limitations of demand analysis in explaining user behaviour

Demand theory is likely to offer only a partial explanation of user behaviour in accessing P medicines. It progresses using 'comparative static techniques'; i.e. it alters one parameter at a time, price, and compares the beginning and end equilibrium. Yet, policy makers seeking to understand and refine policy levers will find the dynamic process(es) of adjustment to changing prices at least, if not more, interesting. It also operates on the 'ceteris paribus' assumption; i.e. that 'other things being equal', everything that affects the quantity demanded, except price, is held constant (Stanlake, 1976). Consumer tastes are assumed to be stable and independent of prices. Yet, forms of non-price competition, like advertising, are increasingly eroding this assumption and changing the nature of demand. This applies to medicine markets also. Multidimensional relationships exist between quantity demanded and a number of factors, of which price is only one (Call and Holahan, 1983). The hedonistic premise (i.e. the tendency to identify the desire that prompts an individual to purchase with the underlying satisfaction derived from a purchase) underpinning demand analysis has been critiqued for ignoring the habitual and conventional forces that shape desires and wants (Blaug, 1996). Institutional economists are increasingly identifying the limitations of traditional demand analysis and advocate consideration of broader socio-economic theories of demand and consumption, contextualising individual action within broader structural and institutional factors that influence consumption choices (Blaug, 1996). This would serve to broaden our understanding of demand both for health services generally and medicines specifically.

Another limitation of the consumers' surplus method is that it primarily focuses on net benefits to users. It does not specifically encapsulate broader effects, such as knock-on impacts on the health sector like changing demand for other services, or ripple effects in the economy more widely. A broader economic evaluation, adopting a multi-sectoral or societal perspective would be required to do that. For this reason, the analysis was explicitly extended utilising economic evaluation methods to consider the changing distribution of costs to users, the health sector and society more generally.

Consumers' surplus is a useful but complex method of demand analysis (Blaug, 1996). However, deviation from its underlying assumptions requires careful consideration and necessary qualification of any conclusions drawn from such analysis. Care was taken to do so in this research. Despite the potential limitations outlined, consumers' surplus analysis provided a useful approach to analysing the impact of the changing prices incurred by users who obtain P medicines via different access routes, the emergent benefits and to whom they accrue.

6.2.1.2 Economic evaluation

Vilfredo Pareto's general equilibrium model underpins welfare economics (and thus economic evaluation methods) and is applied to assess the impact of policies on societal welfare (Call and Holahan, 1983; Gold et al., 1996). However, a number of concerns have been raised regarding Pareto's model and its applications in economic evaluation. First, the extent of acceptability of the Paretian ethical judgements have never been tested empirically and it is unclear if they are generalisable, for example, across different socio-economic groups (Nath 1973). For example, are individuals always the best judge of their own welfare? When one considers the 'merit' good status attributed to health by many economists (a good that society considers a virtual necessity, regardless of income, yet which is often sub-optimally consumed if left to individual consumers) individuals are perhaps not always the best judge of their own welfare (Begg, Fischer, & Dornbusch, 1991; Earl-Slater, 1999; Tresch, 1994). This has led to an ' extra-welfarist' perspective emerging, contending that social welfare should not be determined on the basis of individuals' preferences for health or any other outcome in relation to other commodities, but rather, that health policy should be based on the assumption that the goal of health policy is to maximise health (Gold et al., 1996; Scott et al., 2003).

Second, many of the assumptions of perfect competition, upon which the model is founded, do not hold generally, or in this study. For instance, the existence of taxes and subsidies, alongside imperfect information in the demand and supply of medicines

violate the perfect competition conditions necessary for Pareto optimal solutions to prevail. Perfect competition theory is atomistic and requires that individuals are able to assert 'free' choice in making judgements about their own welfare. Yet, choice may not always be regarded as free, but often constrained by macro level institutional considerations.

The chief objection to the Paretian model, however, concerns its implicit equity implications. It effectively ignores distributional considerations (Nath, 1973). Given that most societies are characterised by inequitable income distributions (Wilkinson, 1992; Wilkinson, 1995; Judge, 1995; Benzeval & Judge, 1996) this seems inappropriate. Achieving Pareto improvements may, in theory, appear desirable. However, it does not necessarily follow that members of society would be happy with the prevailing resource distribution either at the start or end.

The modified Kaldor-Hicks-Scitovsky decision principle (upon which economic evaluation methods are based) advocates acceptance of policy changes if overall welfare is enhanced and winners can potentially compensate losers. However, the fact that, in theory, the gainers can compensate the losers doesn't automatically make the infliction of those losses socially desirable or acceptable (Coate, 2000). The policy outlined in this thesis passes the compensation decision rule and would be regarded as promoting social welfare. However, it is important to note that acceptance of policy on this basis still implies that (economists') appraisal of policy change should be based on different individual or groups' willingness and ability to pay for what they want, thus implying tacit approval of the status quo distribution of resources.

The compensation principle is, however, an interesting one. In theory, the winners from the policies widening access to P medicines and encouraging increased self-medication, could compensate the losers. No obvious mechanism currently exists to facilitate this between users. However, one could argue that in substituting a community pharmacist in place of a general practitioner to access their P medicine, they have released valuable

primary care resources (professional time and medicines) that become available to others who are less fortunate than them.

The key limitations noted above are relevant to how policy makers should interpret the findings of the economic evaluation in this study. Applying the objective welfare criteria implicit in economic evaluation methodology suggested efficiency gains could be realised and societal welfare enhanced (on average). However, even although welfare was improved overall (i.e. on average) across the users, a majority faced increased monetary costs and these were disproportionately borne by typically less affluent users. Thus, in moving from considering objective (efficiency) to more subjective (resource distribution) welfare criteria, it becomes much less clear if the second, post-policy scenario (and its associated resource distribution) is preferred to the first. It is difficult to divorce equity and efficiency considerations (Drummond et al., 1997). The policy analyst is then left with the age-old dilemma of balancing individual versus social welfare. Inevitably, economic evaluation is highly complex. It involves numerous unresolved conceptual issues and questions of social justice (Reinhardt, 1997).

Thus, a number of potential limitations exist in applying the theory and methods of consumers' surplus analyses and economic evaluation in this study. However, all theory necessarily involves simplification and abstraction from reality. It is like a map – drawing out in stark, crude outline the important relationship between variables. (Wonnacott & Wonnacott, 1986). The challenge of this thesis has been to work out the detail of the contours and grid lines and improve upon previous efforts to apply the theory and method in this area. The potential limitations identified should, however, be acknowledged in interpreting the results. These are more fully appraised in section 6.3.

6.2.2 General limitations of the study

There are a number of general limitations to this study that should be acknowledged and considered. These relate to: the cross-sectional nature of the study design; the absence of health outcome measurement; considering all minor illness together; and limits to the costing methods applied.

6.2.2.1 Limits of the cross-sectional study design

Cross-sectional study designs can be problematic, due to their uncontrolled nature and the fact that they provide only 'snapshots' of data that can introduce sources of uncertainty. Potential selection bias may have occurred i.e. the possibility that users who chose to access their medicine from community pharmacies may be substantively and/or systematically different from those who elect to access them from general practitioners instead. Indeed, the sample description suggests that this was in fact the case. Efforts were made to address this issue in presenting and interpreting the results by examining whether there were differences between the full and follow-up samples within the study and comparing the study sample with the broader Lothian Health population, as well as to those of studies reporting upon related issues within the literature. The study included some prospective elements. However, a fully prospective design would have been preferable. Unfortunately, however, this was outwith the scope and resources of the research.

Like most health services research, this study was designed amid an evolving and somewhat implicit health policy development. In this context, and with the research funds available, a cross-sectional design was considered the most pragmatic approach. Nonetheless, caution should be urged in interpreting results and basing policy interventions on inferences derived from cross-sectional findings.

6.2.2.2 Absence of health outcome measurement

Outcome measurement was a contentious issue. Economic evaluations typically include direct health outcome measurement. However, this was problematic and not undertaken for a number of reasons. It is important to note, however, that this study was evaluating the policy encouraging different routes to access P class medicines and not the impact on users' health. It was not clear what the 'value added' to the policy evaluation would have been of attempting to measure health outcome impacts. A key, if not the main, rationale for promoting deregulation of medicines and encouraging increased self-medication using P medicines obtained from community pharmacies, was to improve access to first-contact services to deal with minor ailments, as opposed to improving health outcomes per se. The conditions that the users presented with should, by definition, have been self-limiting, and likely would have resolved themselves without any professional intervention recommending use of a P class medicine. It seemed unlikely, therefore, that discernible improvements in health outcome could realistically be expected, or indeed attributed to a specific, one-off use of a P medicine, accessed from a general practitioner rather than a community pharmacist. Particularly so, as these often take place (and thus are potentially confounded by) in the context of a series of ongoing self-care efforts and/or other health care contacts. For these, reasons efforts to undertake measurement of changing health status in the current study were not attempted.

It may be possible to undertake fuller economic evaluation of particular groups of clients and/or conditions. However, this is likely to require a more complex, longitudinal study design, taking baseline general health status measurements, as well as some related to the specific minor illness concerned, and assessing any change over time, investigating impacts on users' utilisation of different services and any differential results in health outcomes. Arguably however, such a study is still likely to focus mainly on intermediate or process outcomes, such as adherence to recommended treatment strategies, incidence of adverse outcomes, user satisfaction with services, provision of reassurance or information and changing patterns of service utilisation. Even if

changing health status was discernible over time, it may be very difficult (unless one was to apply an RCT design) to attribute effects to particular consultation or management strategies. That said, it would be useful to explore more fully the constituent elements of general practice and community pharmacy routes to access P medicines to treat minor ailments, and their relative value to users of these services.

Validity of considering undifferentiated minor illness

It may not be appropriate to 'lump together' the diverse range of conditions (and their varied severity and case mix) that users accessed P medicines for under the catch-all of 'minor ailments'. This is crude at best. In addition, the study was unable to take account of differences in consultation processes between general practitioner and community pharmacists generally, far less between particular professionals or users specifically. Similarly, for some of the P medicines concerned, there are different licensed indications for their use, depending if they are obtained over-the-counter or on prescription. In theory, if they are being used appropriately, this should be irrelevant. There should be no difference in their clinical efficacy within the context of their appropriate use/application to treat the similar minor illness episodes for which they are intended. However, again this may be uncertain. An RCT design could have helped to address these issues. Unfortunately, however, this was not within the scope of the present study.

6.2.2.3 Limits of the costing methods

There are also some limitations to the costing methods applied within the economic analyses. The study was restricted to calculating only the quantifiable direct and indirect costs accruing to stakeholders. Yet, a broader range of costs and benefits are undoubtedly relevant (Mooney, 1994). For instance, the study did not attempt to measure or value process outcomes (e.g. reassurance). This may be considered as potentially 'reductionist', negating broader costs and benefits of relevance (Jan, 1998) but methodological and time constraints mitigated against this. Future research would benefit from embracing a broader and more inclusive range of potential costs and consequences.

A number of the assumptions made in the costing methods may also be subject to contention. Over and underestimation of costs cannot be ruled out. Estimates were used to calculate elements of the costs, where actual cost data were unavailable, for example, using national reference costs (Netten, Dennett & Knight, 1998). However, these may not have been representative of the local care situation (Smith & Wright, 1994). Further, the cost data are sensitive to the time estimates provided by users. Generally, time estimates provided by users were plausible. However, respondent inaccuracy cannot be ruled out. Observational 'time and motion' type data would have been preferable for collecting user time costs. This would have required a prospective design, which, as noted previously, was not possible within the limited resources available to conduct this research.

Valuation of user time was a particularly contentious issue. Yet, given that either small or no money costs were typically incurred by users, time costs were the main differential. Other research has indicated that those on salary often do not lose out if they require to attend health services (i.e. their time costs are subsidised by their employer) whereas people not in the formal labour force bear the full opportunity cost of their time and consequently often face higher opportunity costs (Torgerson, Donaldson & Reid, 1994). In policy terms, this reversal of the usual order of costs can have

important implications i.e. people in lower socio-economic groups face greater access costs and, as a result, may be subject to inequities (Torgerson, Donaldson & Reid, 1994). This study found the same, highlighting the importance of not treating user time as a 'free input' to health care production processes and the potential implications of the differential value of time within policy analyses. However, we have to acknowledge that users themselves may not consider their time costs in this way.

National average wage estimates were applied to estimates of lost work time due to the perceived infeasibility of collecting individual income data in the interviews and in the interest of maximising the usefulness of the research for policy evaluation purposes. However, these may be regarded as somewhat insensitive. For example, they fail to account for differences in time costs between skilled and unskilled labour. However this would not have had a major impact on user cost estimates as relatively small amounts of the time costs calculated actually involved work time.

Accurate costing of primary care professionals' time was also difficult. At the time of analyses, no unit cost estimates for community pharmacists' time existed within the literature, yet important differences (e.g. variation in the employment status of community pharmacists) are believed to impact these costs (Whittington et al., 2001). Further, general practitioner time costs, may not have been completely attributable to accessing the study P medicine(s) (e.g. if this occurred within a consultation in which other issues were dealt with). The omission of overhead costs within community pharmacies is a further weakness. In order to embrace potential variability, simple sensitivity analyses were conducted, substituting alternative cost assumptions, to identify a range of costs that might occur and to check the robustness of the results. The overall pattern of results or associations did not change. Further, subsequent comparison of the bottom-up cost estimates calculated for community pharmacy in the study with national unit cost estimates (that became available after the analyses were conducted), indicated that they were broadly similar.

Clearly, a number of potential limitations exist regarding this study as designed and conducted. It is difficult to gauge their significance. Efforts were made, wherever possible, to ameliorate their effects. Overall, the results were intuitively plausible. Unfortunately, no body of evidence exists in this area with which to compare the results of the current economic analyses. However, there are uncertainties in all economic and policy analyses. Limitations aside, the methods applied on this study are superior to previous efforts in the area and this research is believed to offer a genuine and unique contribution. It represents an important intermediate stage in beginning to understand the costs associated with the two routes currently available to access P medicines within primary care.

6.3 Implications for policy and practice

A number of findings emerge from this research, yielding potentially important implications for policy and practice. These include: firstly, the extent and interpretation of substitution; and secondly, equity and general policy implications to users, the primary care sector and the NHS.

6.3.1 What do we mean by substitution and is it real?

In the results outlined, the substitution hypothesis was broadly affirmed. However, a number of qualifications require to be considered in interpreting this finding. These relate to whether substitution between general practitioners and community pharmacists may be regarded as a one for one, perfect substitutes.

Community pharmacies certainly offer substitute access points for P medicines. However, accessing a P medicine from a community pharmacy during a supervised sale is a very different process compared to consulting a general practitioner for advice (Hassell et al., 1996. Assuming them to be of equal value negates the potential importance of the varied professional (and personal) attributes that differ between community pharmacists and general practitioners and their interactions with users.

These issues beg the question of whether it is misleading to promote general practitioners and community pharmacists as substitutes in the management of minor ailments using P medicines. Differences in how these primary care professionals are currently used in the management of minor illness does not suggest they are substitutes - users predominantly visit community pharmacies to access medicines (not advice) and visit general practitioners to seek advice (as well as medicines) (Hassell et al., 1998).

Policy deregulating and promoting P medicines have multiple potential outcomes. P medicines may be used to directly substitute another service; they may be used as an adjunct or complement, in tandem by users; they may generate additional or new demand, with people presenting with problems they would otherwise have ignored or dealt with themselves; or they may result in duplication between services, with users attending for problems for which they have already sought advice from other health professional and/or services. Each of these potential outcomes could be regarded positively or negatively, depending on perspective.

Great care was taken in the study to ensure that any follow-up visits to services were related to the minor illness episode discussed with users. Results indicated that one in five of the users who were believed to be attempting to substitute, followed up their visit to a community pharmacy with a general practitioner consultation, suggesting that their substitution was not perfect or complete. How should one consider such complementary usage between the general practitioner and community pharmacist? Follow-up care could be regarded as a negative outcome. It could be argued that P medicines available from community pharmacies should represent a direct substitute for the same P medicine obtained from a general practitioner to treat the same minor ailment. Complementary usage could, therefore, be regarded as potentially duplicative, generating new and perhaps unnecessary demand, directly contravening the policy intention. Alternately, it could be regarded positively. It may in fact indicate appropriate usage of P class medicines; i.e. that they should be used in conjunction with advice from appropriate primary care professionals, especially as most P medicine user information leaflets

recommend visiting the general practitioner if the symptom persists, or if the user experiences any adverse effects. Teasing out these nuances regarding what exactly constitutes substitution is, however, extremely complex and was not addressed in this study.

A related issue is the extent to which the substitution identified in the study is in fact real. It may, in some circumstances, have been more perceived than real. For example, should a P class cough medicine, obtained over-the-counter from a community pharmacy be considered a substitute for a general practitioner consultation if the user would never have considered attending a general practitioner to obtain it, or if the general practitioner would never have considered prescribing it?

New versus old demand is a related issue. For example, if a user previously bought a 'general sales list' (GSL) medicine (e.g. Kaoline and Morphine) from a community pharmacist and now buys P class 'Imodium' (after deregulation and advertising promoting its availability), yet they would never consider consulting a GP to obtain either, is this a substitution? A long-term prospective cohort study (again outwith the scope of this research) would have been needed to disentangle the issues related to new versus old demand.

Further, although we might presume that users were accessing a P medicine from community pharmacies to self-medicate a minor illness episode (as per their licensed indications) we do not know this for certain (although no major problems were revealed at follow-up).

This study was unable to separate out some of these subtle nuances in substitution. Consequently, such cases would have been classed as attempted substitutions and thus may have overstated the impact on demand. A degree of uncertainty exists, therefore, regarding what exactly was captured in this study and the extent to which it may be regarded as substitution between general practitioners and community pharmacies.

The time horizon of substitutions is also important. It is useful, and necessary, to consider substitution issues in terms of either 'point' or 'period' substitution. Point substitution refers to decisions to visit a community pharmacist 'on this occasion' to obtain a P medicine to self-medicate, instead of consulting a general practitioner. However, one cannot make the leap to assume that the user has ruled out consulting a general practitioner for a similar minor illness episode or to obtain the same medicine in future. Period substitution might be considered as occurring where users would always and only visit the community pharmacist to obtain medicines for particular minor ailments, of which they have experience, feel confident self-medicating and would never consult a general practitioner about (acknowledging, of course, that decisions to consult health professionals are usually more complex and contextual – depending on other illnesses and worries etc.).

This study considers 'point' substitution over one maximum of a month only. The data collected concerned only a snapshot of user decision-making regarding a particular illness episode. It is not possible to say, therefore, that because a user either did or did not attempt substitution on that occasion, that they would act in the same way in the future.

Clearly, the substitution concept is a complex one. It appears intuitively sensible, but at present, it is poorly defined and understood. Yet, it is frequently alluded to in health policy debates. The substitution term is rarely defined and, more often that not, used colloquially. Clearer definition of the substitution concept, its aims and the mechanisms or processes considered most likely to achieve it is required to progress these debates. In its absence, we are currently experiencing the inevitable problems consequent from trying to transform the complex conceptual concept of substitution into an empirical health policy reality. If we are to seriously consider substitution issues in health policy we need to get beyond the use of the term as only a rhetorical device or politically expedient rhetoric. In an increasingly evidenced based world there will and should be pressure to better define and evaluate policies aiming to promote substitutions between

care professionals and services within both health care generally and primary care specifically.

6.3.2 Equity and general policy implications to key stakeholders. Who were the winners and losers?

The results of this study overall suggest that encouraging increased self-medication and the substitution from general practitioner to community pharmacists to access P medicines in primary care generates a win-win situation, with all key stakeholders benefiting. However, the results present the impact of the policy to stakeholder groups on average. It is also necessary to identify relative advantage among the stakeholders, identifying the winners and losers. Thus, the following sections specifically consider the potential equity implications of the policy to users, alongside consideration of other potential impacts to users, primary care, the NHS and policy debates generally.

6.3.2.1 Relevant equity implications to consider

Equity is a complex and multidimensional concept. It is important, therefore, to outline the dimensions of equity of particular relevance to the policy under consideration.

At its simplest level, there is widespread agreement that equity implies notions of 'fairness' or 'equality'. Agreeing on equality of what is, however, more difficult. Equity is most frequently defined in terms of Aristotelian principles, whereby, 'horizontal' equity implies the 'equal treatment of equals', and 'vertical' equity, the 'unequal treatment of unequals'. Definitions of equity posited of relevance within the NHS are, however, typically more elaborate. For example, in 1979, a Royal Commission specifically outlined eight equity principles upon which it recommended that the NHS should be founded, including: universal entitlement; sharing financial costs; free at the point of use; comprehensive in range; equality of geographical access; same high standard care for all; selection on the basis of need and not ability pay; and encouragement of a non-exploitative ethos (Merrison, 1979; Whitehead, 1994). Another equity taxonomy commonly cited as relevant to care systems is offered by Mooney

(1982, 1992, 1994) and includes: equality of expenditure per capita; equal inputs per capita; equality of inputs for equal need; equality of access for equal need; equal utilisation for equal need; equal marginal met need; and equal health.

Comprehensive appraisal of the equity implications of the policy examined in this thesis is thus likely to be very complex and outwith the scope of this discussion. It is argued, however, that equality of access is the most widely accepted and 'traditional' equity principle referred to in the NHS (Powell, 2003) Indeed, Powell (2003) notes that recent government policies reinforce this in their commitments to reduce 'unacceptable variation' and provide a 'one nation' service characterised by 'fair access'.

The researcher believes that the policies to increase self-medication and the substitution from general practitioners to community pharmacists to obtain P medicines were predominantly intentioned to improve access to primary care (as part of the government's broader goals of developing improved, graduated access services). For this reason, appraisal of the policy will focus on equity of access considerations.

Equity of access, should, in Mooney's opinion, be the overriding aim of care systems, given the impossibility of achieving equal health and difficulty in ensuring equal use of services (Mooney, 1994). He suggests that it should consider the cost of gaining access to potential users of services, noting that they should have the same opportunity to use health care i.e. face the same opportunities and supply curves to use health care (Mooney 1992, 1994).

Goddard and Smith (2001) in a recent review of the theory and evidence pertaining to equity of access to health care services offer a more detailed and rigorous outline of theory and evidence pertaining to equity of access to health services. They note that it is a horizontal equity principle and a purely supply side consideration, addressing the extent to which there exists equal access for equal need. They define access as referring to: "the ability to secure a specified range of services, at a specified level of quality,

subject to a specified maximum level of inconvenience and cost, whilst in possession of a specific level of information" (Goddard & Smith, 2001, p.1185). In line with their definition, they note that variations in supply side can arise due to differences in availability, quality, cost and information. They caution, however, that it is difficult to observe access directly and that it is usually utilisation that is observed which reflects the extent to which 'potential access' is converted into 'realised access'. These are the definitions and issues relating to access that are applied in considering the equity implications to users of the policy studied in this thesis.

6.3.2.2 Implications to users

The results of this study suggest that users would benefit overall (i.e. on average) in terms of time and resource costs if they substitute accessing P medicines over-the-counter from community pharmacists as opposed to obtaining them on prescription from general practitioners.

However, closer scrutiny of the findings indicated that current policy arrangements that control access to P class medicines, yield mixed results, advantaging some and disadvantaging other users, both in terms of their willingness to attempt substitution and the total time and resource costs they incur in accessing P medicines. Generally speaking, healthier, more affluent users were significantly more likely and less affluent, iller users significantly less likely to attempt to substitute. Further, both total and time costs were, generally, significantly higher among users reporting less favourable socio-economic circumstances; who perceived themselves not to be in good health; and who were more frequent users of primary care. The crucial point is that in current policy circumstances, already disadvantaged people are further disadvantaged, not in terms of monetary, out-of-pocket expenses, but in terms of time and, consequently, total costs.

While the policy makes good sense overall (on average to all key stakeholders) users fare least well. Resource savings swing heavily towards the health sector. It should be acknowledged, however, that users are also taxpayers who pay for the NHS and thus

have an interest in reducing its costs. That said, users would be only marginally better off on average overall. They would face an increasing proportion of time and resource costs. Over half (55%) of users would be worse-off in terms of money costs, which would increase between two to seven times, with the majority of these increased costs borne by users in less favourable socio-economic circumstances.

Different sensitivities regarding time and money prices existed among different user groups. More affluent users appeared willing to pay higher money prices in order to obtain P medicines from community pharmacies. There may be many reasons for this including: preference to use the pharmacist whenever possible; reluctance to visit a doctor; enhanced convenience, including reduced waiting times to access care and no need to take time off work; desire to obtain particular medicines e.g. those blacklisted on NHS prescribing lists; and ability and willingness to pay. These reasons and others were cited by users in this study when asked about use of community pharmacies. In contrast, it appears as if money rather than time prices were key in discouraging substitution attempts among less affluent users. Other research has shown that users who may find it financially difficult to buy medicines over-the-counter, see general practitioner consultations as a way to get medicines free (Hassell et al., 1997).

Equity implications to users

Having summarised the key findings to users, it is interesting to consider the potential equity implications associated with them. For the reasons specified in section, this section will focus on equity issues pertaining to access.

The results suggested that while users accessing P medicines on prescription from general practitioners incurred lower out-of-pocket medicine costs, they incurred higher costs overall when the value of their time was accounted for. This is interesting as it suggests that these users were making seemingly 'irrational' choices, opting to pursue consultation routes that consumed more of their resources overall, increased their waiting times and delayed their access to care.

This delay in accessing care is important when one considers the often minor and self-limiting nature of the conditions concerned. Users whose only option is to consult a general practitioner to obtain a prescription (which they receive free) must wait longer, consigning them to suffer relative inconvenience and discomfort, compared to users who can afford to buy the required P medicine immediately.

Thus, the key equity of access principle upon which the NHS is based may be being violated under current primary care policy conditions. Contrary policy directions appear to exist. The current government is committed to policies that enhance social justice, reduce inequities and address social exclusion issues (Department of Health, 1997b; Department of Health 2000). For example, recent government policy documents propose that patients should get 'access to the NHS based on need alone and not on your ability to pay' (Department of Health, 1997b). Yet, it appears as if access and equity policy goals clash in their efforts to open up access to minor ailment care via medicine deregulation and encouragement of self-medication and greater use of community pharmacies. The policy appears to be sensible and well intentioned. However, it may inadvertently be introducing inequities of access in the primary care system. An important consideration at a time when government policy objectives aim to ensure, 'fair access to consistently high quality, prompt and accessible services right across the country' (NHS Executive, 2001).

Access is, of course, a complex and multidimensional concept (Rosen et al., 2001). Gulliford et al (2002), like Goddard and Smith (2001) highlight the important distinction between 'having access' and 'gaining access' (similar to Goddard and Smiths 'potential' and 'realised' access). They note that gaining access is dependent upon financial, organisational and social or cultural barriers. In theory, all users in the study 'had access' to P medicines over-the-counter from community pharmacies. In reality, however, many did not 'gain access' to them by actually buying them. Again though, there may be many reasons that users opted to gain access to their P medicine from a

general practitioner (as opposed to from a community pharmacist) making their choices entirely reasonable, if not rational (Etzioni, 1988; Hargreaves and Heaps, 1992), many of which relate to the potential barriers to utilisation identified by Gulliford, including: inability to afford or unwillingness to pay for medicines over-the-counter; valuation of personal time at less than the financial costs faced; prescription exemption status; and preference to consult a general practitioner rather than a community pharmacist for advice and medicines to treat minor ailments (Gulliford et al., 1992; Gulliford et al., 1992). Again, many of these issues were raised by users in this study when asked about use of pharmacy and doctors' services.

Facilitating more expeditious access to P medicines for the treatment of minor ailments is one of the key rationales underpinning deregulation trends for such medicines. However, this improvement in access appeared only to be realised among certain groups of users. In theory, access to P medicines was not denied to any group. It is difficult to conclude this with any certainty however. The study design was not prospective and involved users which, in the absence of a population denominator to ascertain level of unmet need, made this impossible to determine. However, a twin-track system appeared to be operating, with some users in a fast and others in a slower lane. Those users able and willing to pay for P medicines over-the-counter, with no strong preference about consulting a community pharmacist as opposed to a general practitioner to access P medicines, were able to by-pass general practice and access P medicines faster (reducing both their waiting time and total time overall). This could be regarded as the primary care equivalent of queue jumping in secondary care services, or a form of covert rationing – pay or spend much longer accessing medicines. Yet, theoretical and empirical models suggest that the price elasticity of demand is likely to be higher for lower income groups and that user charges are unlikely to promote equity or reduce existing health status inequalities (US Congress, 1993; Eversley & Shepard, 1998; Mills & Lee, 1993; Van Doorslaer, 1993; McPake, 1993; Lundberg et al., 1998; Reutzel, 1993). Meeting monetary charges is always likely to be difficult for certain user groups, who by default, therefore, are denied the opportunity to benefit from quicker access to P

class medicines to manage their minor ailments. Further, public health principles generally advocate against the levy of charges on primary health care services in view of their 'gatekeeper role' (Mills & Lee, 1993). User charges should not hinder general access or continuity of care.

It is important to consider, however, that while there did appear to be differences in access, convenience and cost to users, how material and important are these differences likely to be in terms of their health consequences, or in terms of NHS resource priorities? It is also important to remember that the potential inequities identified concern the costs of access as opposed to access per se. To what extent does it matter that people feel that they have no option but to spend more time consulting a general practitioner to access a medicine or who choose to do this because they can access medicine free that way? If such people put a low opportunity cost on their time, does this reduce the need for the NHS to respond? Is it unfair for someone who is richer in time to use that commodity while someone else with less time uses money to access a service?

Potential emergence of inverse care

Thus, recent policy restructuring access to P medicines may be invoking what might be regarded as a modern-day manifestation of the 'inverse care law'(Hart, 1971). Tudor Hart (1971) hypothesized that 'the availability of good medical care tends to vary inversely with the need for it in the population served'. He suggested that market mechanisms for allocating health care result in inequitable access to medical care services. A number of studies have subsequently investigated the operation of inverse care laws within the UK, some of which confirm its existence (Benzeval et al., 1996; Ben Schlomo et al., 1995; and Gillam 1992) and others that refute it (e.g. Powell, 1986 and 1990; and Wyke et al., 1992).

It is useful here to consider the contemporary relevance of the inverse care law, as well as debates around its meaning or operation and its salience to this study. For example,

Powell (1990) disputes the existence of an inverse care 'law', noting that key studies that appear to confirm its existence inadequately define or measure key concepts associated with its investigation e.g. need, availability and quality of care. In particular, he notes that they narrowly adopt need as their only concept of social justice, disregarding others including, for example, merit or common good (Powell, 1986). Further, he notes they fail to differentiate between ascribed 'normative' need and personal 'felt' need, or to consider the multidimensional nature of need.

Many of these issues are also relevant in considering whether policies aiming to enhance access to P medicines have introduced inverse care within primary care. The inverse care law as formulated by Hart is predominantly about access to care services. As noted previously, a key aim of the policy under study is to enhance and expedite access to P medicines. As such, Hart's inverse care law is of central relevance.

This study suggests differential access to P class medicines currently exists in primary care (in that inequalities in access to P class medicines exist that are systematically related to socio-economic status). It did not, however, find this to be operating at the level of a 'law'. Results were not invariant. Rather, general trends emerged from the data at the sample population level. Effects on individuals or groups of individuals were, however, found to vary. Indeed, the study findings could be interpreted to indicate that the neediest get access to equal if not better quality advice but at a higher time costs and lower financial cost. Whether this amounts to confirmation of inverse care is open for debate.

Major difficulties exist defining need and the 'appropriate response' of care systems to needs (Powell, 1986; Carr-Hill and Sheldon, 1991; Sheldon et al., 1993). Inadequate definition of central concepts such as need, availability and quality of care, pointed out by Powell, are also evident in this study, making robust, meaningful comparisons about relative access, use and outcomes across different users and groups difficult, if not impossible.

For example, if this study adopted common good as its main measure of social justice, then the results at the societal level indicating overall improvements, on average, would suggest that the policy was successful, even though certain groups of users appear to be disadvantaged. Likewise, were it to be explicitly acknowledged that the NHS cannot continue to provide all health care services free at the point of use, with users expected to contribute to their care costs, then ascribed versus personal, felt need may be of key relevance. Further, if an explicit policy decision was taken, de-prioritising access to minor ailment care relative to more serious care needs, then the inverse care apparently emergent from deregulation of medicines may be acceptable, even if regrettable. In addition, this study is unable to make any judgement on the 'quality of the care' accessed by users adopting different routes to access their P medicines. For example, perceived differences among users regarding the quality of care obtained from the general practitioner compared to the community pharmacist may be the main driver for users to elect to obtain their medicine via prescription routes, rendering time or money costs as either secondary or even unimportant. In the absence of knowledge of the explicit policy intent of medicine deregulation for minor ailment care, or a fuller understanding of user preferences and choices regarding different ways to access P class medicines and minor ailment care, it is not possible to arrive at any final judgement on these key issues.

Caution must, however, be urged in treating equity in provision of services as synonymous with access. For example, community pharmacies currently provide access to P medicines over-the-counter for anyone who wishes to buy them (within their licensed indications). User choices are, however, rarely free from external constraints. Recall Duesenberry's aphorism that, 'economics addresses how people make choices and sociology about how they have none to make' (Etzioni, 1988; Baron, 1994). Poorer access and/or outcomes among certain user groups may relate to multiple factors, including economic and legislative structures and access to material resources in their broadest sense e.g. adequate housing and education, or some combination thereof

(Townsend & Davidson, 1982; Wilkinson 1992 and 1995; Kaplan et al., 1996; Kennedy, Kawachi and Prothrow-Stith, 1996).

6.3.2.3 Implications for primary care

The implications of encouraging users to self-medicate using P medicines accessed from community pharmacies, as opposed to general practices, appear to be generally positive. At the sectoral, primary care level, economic analyses of the policy are generally favourable. It appears as though the substitution hypothesis implicit in the policy is broadly realised and that, in addition to providing improved access to P medicines, scope exists to deal with minor illness episodes more efficiently within primary care.

If the aim of policy promoting self-medication for minor ailments is to facilitate more expeditious access to care and reshape and move the NHS towards a more responsive, customer friendly, immediate care system, that gets the right patients to the right professional and place at the right time, one may consider the policy a success (albeit with some qualifications). An alternative interpretation of the policy rhetoric could, however, be that it is more about giving the health service what it wants, as opposed to increasing consumer choice and responsiveness (Eyles & Woods, 1986). Whichever interpretation, encouraging substitution between general practitioners and community pharmacists is a core component in enabling delivery of the government's agenda of 'graduating access' to primary care services and matching users to the most suitably qualified primary care professional to deal with them, as well as helping to assist in the commitment to reducing waiting times to consult with professionals in primary care (Department of Health, 2000).

However, a number of key questions remain unanswered and the full impact of this service reorientation remains unclear. In particular, the true effect on primary care professionals' time remains unknown. Economic evaluation methodologies generally assume that freed resources are put to efficient, worthwhile, alternate uses (Drummond et al., 1997) This may not be the case and little may change. If freed general practice

consultation slots are filled, the impact on the volume of medicines prescribed by general practitioners and dispensed by community pharmacists is uncertain. Ideally, such policy shifts would hope to reduce demand and/or effect changes in the case mix of consultations, with general practitioners dealing with more serious clinical issues. The Care at the Chemist and Direct Supply of Medicines pilots suggests, however, that the impact on overall workload was very small, with general practitioners noting little perceptible impact (Whittington et al., 2001; Schafheutle et al., 2003). Evidence from research investigating national primary care skill mix experiments - NHS Direct and Walk In Centres – also report limited impact on demand or the composition of workload (Munro et al., 2000; Salisbury et al., 2002a; Salisbury et al., 2002b; Salisbury et al., 2002c). Further, if one considers the 'symptom iceberg' (Hannay, 1979) that suggests that only one in forty people with symptoms present for care, then this may not necessarily hold. Freed general practitioner slots may equally be filled with previously unmet minor illness need.

Further, while the policy may yield technical efficiency gains (i.e. getting the most out of available resources) in the management of minor ailments in primary care, this does not necessarily mean that it is allocatively efficient in terms of optimising the distribution of resources within the primary care sector specifically or the NHS generally. Within the resource constrained primary care sector, do the benefits of this strategy outweigh the costs and how does it compare to other potential uses of scarce primary care resources?

The contribution of this policy initiative to the overall efficiency of first-contact, NHS care has not been fully explored and cannot be based only on changes in the direct cost of providing access to P medicines. Rather, it needs to be put into the bigger picture, relating also to what is happening in other care centres, with a more comprehensive understanding of the level of additional or duplicative care provided and of the extent of substitution and/or complementarity between services and professionals. For example, what is the impact of increased self-medication not only on subsequent general practice

utilisation but also on telephone consultation to NHS Direct or NHS24, general practice out-of hours services, minor injury units and accident and emergency departments? As the boundaries between different types of unscheduled, first contact care become increasingly blurred, teasing out the issue of old versus new demand becomes increasingly relevant, albeit difficult. It is crucial to remember that we are dealing with new health care contacts, as well as those that already exist.

Even if such policy initiatives succeed in changing demand patterns, are they cost offsetting? These questions are incredibly difficult to try to answer as any resultant costs and savings occur across different budgets and care sectors. In addition, the impact of such changes is situationally dependent upon capacity and demand issues across sectors. For example, the marginal benefit of reducing demand for general practice consultations may be negligible if practices face excess demand and freed consultation slots are immediately filled. Related to this point is the importance of time horizon. Even if costs or savings were incurred across services, they may not be obvious in the short-run and only relevant if they permit long-run reconfiguration of service conducive to improving both the technical and allocative efficiency of service provision overall. Thus, the impact of such initiatives is often far from obvious and incredibly difficult to trace or detect.

There may also be broader implications of the increased array of 'first access' or 'gateway' services within primary care on quality and continuity of care. Is there a danger that consumerist, episode-based care systems might have a detrimental effect, disrupting personal continuity of care, potentially resulting in fragmentation of care or separation into service 'silos'? Also, what is the impact on quality of care? How do we ensure consistent, evidence-based care and continuity of information across varied providers? This has been difficult enough to achieve within single care settings in the NHS; achieving this between sectors and professionals is likely to be fraught with difficulties. Are there dangers inherent to diluting the skill mix among providers of first contact care? A plethora of services and a mixed economy of care may provide several

ways into the system however issues of consistency in training and advice inevitably arise. Further, offering increased choice may not be a good thing, in the absence of understanding how people make them. With enhanced choice comes the danger that people make the wrong choice, with potentially adverse consequences. Ultimately, we need to consider whether current policy aiming to graduate access to primary care - of which medicine deregulation and encouraging increased self-medication using P medicines for minor ailments are central strands – are meeting people's needs and, in particular, are they reaching vulnerable groups? Ongoing attention must be devoted to investigating emergent variation in use to ensure that no groups are routinely or systematically disadvantaged. Consequently, future efforts to change or improve access to P medicines in primary care would require us to learn more about users who either did not consider substituting or those that were unsuccessful in their substitution, in a bid to address these issues.

Finally, the economics of the consultation(s) remain unknown. The economic analyses presented in this thesis assessed the economics of the two existing routes to access P medicines, as opposed to the economics of user consultations with either general practitioners or community pharmacists to access P class medicines. This is a fine but extremely important distinction. This study has contributed to understanding of the relative costs of general practice versus community pharmacy routes to access P medicines. However, in the absence of direct benefit assessment of clinical and other relevant outcomes (to both professionals and patients) it has not been possible to undertake comprehensive economic evaluation of the two access alternatives. This work remains to be done.

6.3.2.4 Implications for the NHS overall

The results presented suggest that the policy encouraging increased self-medication for minor ailments, utilising P class medicines obtained from community pharmacies, appears to have been successful on many fronts. However, as with any policy or service development, it should not be viewed in isolation. It is important to consider its relevance not only to key stakeholders but also to adopt a more strategic, 'whole systems view', considering its implications for the NHS overall and society generally. This systemic view is crucial if, amid ongoing organisational change in the NHS, we are to avoid conducting isolated policy analyses upon a disparate collection of services as opposed to the health system as a whole. In this context, the broader implications of this research in relation to access to care are also of relevance.

Community pharmacy and general practice services do not operate in a vacuum. Consequently, a number of service level questions emerge from this policy development. For example, where does community pharmacy feature on a complete patient pathway or journey, within primary care and beyond? How does it fit in with the existing spectrum of services? Might we be unintentionally building in contrary expectations, for example between the primary and secondary care sectors, by increasing access for less serious conditions at a time when there are genuine problems meeting access for more serious ones? It is a perplexing irony that within the current NHS system the most seriously ill often wait while services are developed to speed up access to minor ailment care.

Symptom and service icebergs are traditionally inverted i.e. with the vast majority of resources dedicated to providing services and care for those with more serious needs and vice versa. One could argue that investment in improving first contact care is overdue and will go some way to redressing this historical trend. It has been argued that if equity of access to health care services is, a desirable policy goal, this should also apply to self-care and self-medication opportunities (Lowell & Levin, 1990). This begs the question of whether it would be desirable for the NHS to be funded to provide an unlimited scope of service on equitable access terms? Would encouraging increased access for minor

ailment care be a good use of the resources available to the NHS overall? For example, the cost of prescriptions for laxatives in primary care (which are routinely available as both general sales and P medicines) are currently said to exceed the NHS spend on cancer treatments overall (Bond, 2004, Personal Communication). Such examples may make one consider whether the NHS should pay for P medicines at all?

Often focused policy evaluations begin with the tacit assumption that the objectives are worth meeting (Drummond et al., 1997). But are they? Do the benefits justify the costs? Are there more efficient ways of achieving the same objective (e.g. by simply increasing capacity in general practice)? In a society seemingly increasingly less tolerant of illness, 'quick-fix' solutions are popular. Again though, one should consider at what cost? For example, what are the potential implications for appropriate use of services and medicines? Indeed, this may be an argument for retaining a measure of time and financial cost barriers in the minor ailments system. Finally, is there a danger that we may decrease people's ability to self-care, with potentially damaging long-term consequences (Bradley & Bond, 1995)?

A related issue, is the level of service that the NHS can reasonably be expected to provide. Most people would welcome improvements in the process outcomes associated with increased use of P medicines, such as quicker access, reassurance and convenience. Indeed, economists increasingly recognise the value and necessity of incorporating such process attributes of care within the cost-benefit calculus, thus avoiding an overly consequentialist focus on health outcomes only (Ryan & Shackley, 1993). These are worthy goals, but relative to what, and at what opportunity cost? There is no doubt that process attributes were important in users' consultation choices in this study, convenience particularly. How these process outcomes should weigh relative to other outcomes remains a contentious issue and question for debate (Bond, 2003). The convenience of a non-appointment service to access P medicines may seem a perfectly reasonable way to improve access to medicines from the users' point of view. However, there may be a fundamental difference between reasonableness from the users' point of

view and efficient use of resources within the health care system overall. Improving access to minor ailment care may indeed enhance users' experience of processes of care, however, it may also increase total demand with little or no real health gain associated. If, however, users are indeed substituting P medicines obtained from community pharmacists in place of general practice consultations then, they may in fact be relieving pressure on the NHS. However, if access is enhanced only among relatively healthier, middle-class users, with fewer health needs, that can afford to pay (the health care for working people critique) then inequities may be introduced.

Access is another key consideration at the system level. Improving access to resources (community pharmacies and P class medicines) facilitating users' ability to self-manage minor ailments was a key rationale underpinning efforts to encourage substitution between primary care professionals and services. However, the 'access' concept goes beyond individual access to individual services. Access issues concern the health system as a whole. Efforts to improve first contact or immediate care should, in principle, be applauded. However, once users are in the system what happens then? If initial access is expedited, by enabling users to obtain certain medicines, only for users to languish elsewhere in the system if further care is required, then there is the danger that all that has been added is an additional and potentially duplicative layer of service, elongating the patient pathway and complicating it. It is important to remember that access is not synonymous with speed or quickness. Being seen quickly may not be users' only priority, even if it is a major political priority in the UK. Access is also about choice and varied routes into care. Ensuring appropriate access is key for all concerned. For example, the evaluation of NHS Direct developments indicated that 15% of users were directed to a level of care more than they required (i.e. over-management) and 1% to a level of care less than they required (i.e. under-management) (James Munro, personal communication). Consideration of the appropriateness of users' choice of consultation route to access their P medicine was not feasible in this study. However, it is an important question, worthy of further study.

Care must also be taken to minimise the development of perverse incentives in introducing policies that result in increasing proportions of total time and resource cost burdens being met by users. For example, e.g. charging for primary health care services (direct or otherwise) may lead to over-utilisation of 'free' accident and emergency services. Lack of information regarding the cross-price elasticities between health services make such impacts difficult to estimate. However, reduction in inefficient use of one service could be replaced by increased inefficient use of another. Further, there may also be the danger that by encouraging more affluent, and usually healthier, users to by-pass the prescription medicine system that we might encourage risk selection, separating the healthy from the sick, potentially undermining the community insurance basis that the NHS is based upon.

6.3.2.5 General policy implications

Finally, there are a number of general policy implications and lessons resulting from this study. From a public policy perspective, the policy evaluated appears to be sensible and consonant with the government's objectives of encouraging more graduated access to first-contact care (Secretary of State for Health, 1997; Rogers, Entwistle & Pencheon, 1998). It would appear to promote a more technically efficient approach to expediting access to P medicines, optimising lay and professional skill mix. At the same time, it offers potential to enhance allocative efficiency by freeing up primary care resources for relatively 'needier' patients, facilitating redeployment of saved resources to improve existing, and develop new, primary care services.

This policy presents an interesting example of a policy that makes society better off, on average, in that while it shifts an increasing proportion of the financial costs met by users, it reduced the overall time costs they face in doing so, thus reducing overall costs and speeding up their access to care. However, as with most policies, it makes some users better off and others worse-off.

It is almost impossible to introduce changes that disadvantage no one. Policies are, however, more likely to be successful if the costs are diffused over large numbers of people, as with the policy in this study (Getzen, 1997). The crucial question for policy makers is whether the post-policy distribution of benefits and costs is preferable to the pre-policy situation and even if it is not, is it acceptable? The answer to this question will undoubtedly depend on balancing efficiency and equity alongside political considerations (Sloan & Brabowski, 1997).

The policy is also interesting as it sheds light not only on how policy influences behaviour (at the structural level) but also how behaviour influences policy (at the agency level). It has successfully encouraged many users to substitute. However, the policy has not completely altered behaviour. There remain substantial numbers of users who have not changed how they access P medicines, continuing to consult general practitioners to obtain them on prescription. Thus, the policy as currently formulated is only partially efficient. A number of factors may explain this.

Previous research evidence and the results of this study indicate that demand for medicines is price-elastic. There is no reason to think that P medicines are any different. Thus, consideration of the pecuniary incentives inherent in the current policy is useful. The policy currently appears to incentivise substitution where the resource-outcome trade-off is favourable to the user concerned. This presupposes, of course, that the user is happy to access their medicine from a community pharmacist rather than a general practitioner.

The fact that the policy is not completely efficient is, perhaps unsurprising. Consideration of the pecuniary incentives inherent in the policy is again useful. Substituting from general practices to community pharmacies to access P medicines would have resulted in over half of the study users facing increased financial costs but reduced time costs. Whether users would perceive themselves to be better off in this situation depends on how they value their time relative to the financial costs they faced.

In this study, user time was explicitly valued in order to accord it an appropriate opportunity cost and factor it into the cost-benefit calculus. However users' personal time valuation is crucial. The monetary valuation attached to the resources consumed may not necessarily match the actual money costs faced by users (e.g. users may have incurred absolutely no direct financial cost if they walked to the general practitioner and obtained a prescription for which they were exempt from payment). The opportunity cost of time to users cannot be assumed to be equal. This has important implications. If private costs to users are perceived to exceed private benefits, then compliance with desired policy must be expected to be low (Posnett & Jan, 1996). Policies may seem to benefit the majority of people according to objective evaluation criteria, but may not benefit the majority according to self-assessment (Heckman & Smith, 1994). Thus, if users do not consider their time to have an opportunity cost, or if they consider their time to be less valuable than the financial cost they faced, then it makes sense that they would still opt to access their P medicine on prescription from a general practitioner. Thus, money rather than time prices may have dominated some users' choices. If a user perceived him/herself unable to meet the financial cost of medicines, substitution may not have been perceived to be a realistic option, or seriously considered. Among such users, the current policy does not, nor does it ever seem likely to, incentivise substitution. Indeed, the opportunity to substitute the community pharmacy in place of the general practice as the access point for P medicines may have been effectively denied to such users. Again, however, it is important to note that pecuniary incentives present only one among a variety of alternate explanations regarding why users chose to attempt substitution or not. For example, for users with longstanding illnesses, taking multiple medications or who believe only doctors should dispense medicines, they may never have considered visiting a community pharmacy to access a P medicine, regardless of the time or resource costs they faced.

The challenge for health policy makers is to optimise the efficiency of the policy, in the face of heterogeneous response, by maximising the substitution opportunities from general practice to community pharmacy to access P medicines, among users happy to

do so (Heckman, 2001). In order to achieve this, the policy must present win-win scenarios to individual users and not only on average across the population of users.

There is little in the short run that policy makers can do to change the socio-demographic and socio-economic characteristics of users. They can, however, counteract the sub-optimal response by modifying the policy to remove any potential obstacles to substitution among users willing to try to do so. The financial obstacle is, perhaps, the most obvious one. This is, perhaps, fortuitous, as financial incentives are generally the most direct (albeit crude) lever available to policy makers to influence behaviour. Prescription exempt users may be more likely to consider substituting between the general practitioner and the community pharmacist to access P medicines if it is cost-neutral to them in money cost terms. Thus, were such users able to access P medicines over-the-counter from community pharmacists free of charge, reflecting their prescription exemption status, this would seem more likely to incentivise them to substitute. This is an option that has been considered by policy makers and found to be workable in pilot schemes (Pharmaceutical Journal, 1999; Whittington et al., 2001; Schafheutle et al., 2003). The modelling scenarios investigating the cost implications associated with making medicines free over-the counter to prescription exempt users, while paying pharmacists a fee to offer this service, also suggests that this would not compromise the welfare improvements associated with the policy overall. This would enhance the efficiency and equity of the current policy, in that inequities could potentially be minimised and the welfare gains more evenly distributed.

Further, evidence from the literature indicates that there is broad support for increased use of community pharmacies (Hassell et al., 1998; PAGB, 1998). A third of users participating in the telephone follow-up interview agreed, noting that they would prefer to use the community pharmacy as opposed to general practice whenever they could. Of course, unless it is made impossible to access P medicines from general practitioners, it will never be possible to ensure that the substitution policy is totally efficient. There will always be users who, for a variety of reasons, will always opt to access their

medicines from a general practitioner. That said, removal of the financial cost obstacle may go a long way to improving the efficiency of the policy. The results of this hypothetical policy scenario indicated a win-win situation on average overall, and for the vast majority of individual users (Whittington et al., 2001 a & b; Schafheutle et al., 2003). Further, it has the advantage that it involves relatively minimal disruption to other services and requires little new resource (Whittington et al., 2001 a & b).

This potential policy solution is not, however, without risk. It could potentially open-up the floodgates and expose the NHS to massively increased medicine costs. Thus, a system would require to be designed to minimise over-consumption (moral hazard) as well as inappropriate consumption (Donaldson & Gerard, 1993). For example, making P medicines available free over-the-counter to prescription exempt users could be an option only available to users who had previously consulted their general practitioner about the illness and medicine concerned and required a repeat prescription (for the same medication). Similarly, the medicines may only be made available free on repeat prescriptions from community pharmacies in the same quantities available in their over-the-counter licensed indications. Further, limits could be set for the medicine, either in terms of total consumption or number of requests, with users referred back to their general practitioner once those limits were reached to ensure continued safe and appropriate usage of the medicine concerned. Such efforts could help to improve the efficiency of policy efforts to encourage substitution between general practitioners and community pharmacists as access points for P medicines.

Continued attention to the policy of increasing use of community pharmacies will, however, be necessary. For example, Rogers and colleagues highlight the importance of 'place' in the demand for and use of community pharmacies. They remind us that inverse care can also arise related, not only to comparative use of community pharmacies, but also in terms of the quality and level of services, the attention people receive and the environment within which services are delivered. Consideration of these

issues will become increasingly important as more services are devolved to community pharmacy (Roger, Hassell & Nicolaas, 1999).

It is important to remember, however, that while eliminating differential access is the prime safeguard against emergence of inequities, access is only one contributory factor in understanding health and illness, minor illness included. While evidence exists to suggest that health and illness are patterned by social structures there is little evidence about the importance of access to health care services per se. Mildred Blaxter (1996) highlights this, noting, 'no service can offer equal treatment for equal need, it can only offer equal access to doctors who will inevitably apply different criteria of need and different kinds of treatment. Equality of access does not necessarily mean equality in either treatment or outcomes' (Blaxter, 1996). This is illustrated within the current study also. Even if all users could access P medicines in equal time and free from their preferred practitioner (for example if access to general practices was made more like that in community pharmacy) one would not expect to achieve equality in treatment or outcomes). Differences in treatment and outcome are still likely to emerge dependent upon numerous factors associated with the consultation process (e.g. professional expertise and experience, the exchange between user and care professional, format and length of the consultation etc). It is important to acknowledge, therefore, that, whatever the equity principle adopted and however hard we try to maintain equity of access to services, trade-offs will always occur between efficiency equity and choice.

6.4 Implications for future research

A number of implications for future research emerge from this study. There is much still to learn about why different users access P class medicines in different ways. Interdisciplinary, multi-level frameworks are required to understand user decisions to access P medicines for minor ailment care. Research utilising a range of theoretical and methodological approaches can help with this (Jesson, 1993; RPSGB, 2000). The mainstream neo-classical, microeconomic theory underpinning the methods in this study is uni-directional. While providing useful insights at the micro, individual user level, it is less useful for understanding or predicting behaviour at the societal level. (Coast, 1999; Ormerod, 1994; Pescosolido, 1991; Pescosolido, 1992; Tudor Edwards, 2000). Social structures are not irreducible to individual behaviour (Etzioni, 1988; Etzioni & Lawrence, 1991). Thus, alternate theoretical perspectives, such as institutional economics, may be usefully applied to further consider many of the micro-macro linkage issues emerging in this study. The entrenched utilitarian, rationalistic, individualistic, neo-classical economic paradigm trivialises the role of habit, culture and institutions (Etzioni, 1988; Etzioni & Lawrence, 1991; Pescosolido, 1992; Baron, 1994; Lewin, 1996). To understand individual action, one must understand also social context. This vision is one of 'homosociologicus' in contrast to 'homoeconomicus' (Etzioni, 1988; Hargreaves & Heap, 1992). Institutional economists contend that policy programmes cannot, and should not, be evaluated in isolation from the communities in which they are set as this seriously limits the usefulness of policy appraisal undertaken on this basis (Jan, 1998). An institutionalist approach would depart from the deductivist mode characteristic of mainstream microeconomic theory and focus instead on historical and institutional contexts underpinning the system, seeking structural evidence to explain patterns of behaviour. (Coast, 1999; Blaug, 1996) It would investigate the multidimensional relationship between demand for P medicines and factors other than price, developing much needed, broader, socio-economic theories of self-care behaviour generally and consumption of P medicines specifically; exploring economic, infrastructural and cultural-cognitive contexts of self-medication (Geest & Hardon, 1990; Kirkbusch, 1990; Tudor Edwards, 2000). Mays et al (2001) reflecting on the

'messy' process of evaluating evolving health policies agree, noting that consideration of the impact of the context in which interventions are introduced on their potential outcomes is essential and likely to increase the relevance of evaluations for policy development (Mays, Wyke & Evans, 2001).

More micro level work is also required. There is currently an absence of developed models of demand for individual or groups of drugs. This is required to progress more macro level analysis (Bond, 2000). In addition, evidence on the cost effectiveness of over-the-counter P drugs is scarce and desperately required (Richardson & Maynard, 1998) (e.g. to develop formularies for over-the-counter medicines to inform consumers and ensure that the medicines they purchase are of evident effectiveness and least cost (Bloor, 1997)).

A particularly contentious issue in this study, worthy of more attention, concerns the inclusion of indirect costs and benefits within evaluation. Currently, there is little consensus on whether, and if so, how, to impute shadow prices for non-marketed and indirect care inputs generally, or to value the opportunity cost of user time, specifically. (UK Working Party on Patients' Costs, 1999; Palmer & Raftery, 1999; Posnett & Jan, 1996; Koopmanschap & Rutten 1994; Torgerson, Donaldson & Reid, 1994). Yet, in situations where user time inputs to care processes are a key, and perhaps the only, difference between options, as in this study, it is crucial to decide. A macro level, societal preferences approach versus a micro, individual user preferences approach implies very different opportunity cost perspectives. Yet, ensuring appropriate consideration of each approach is essential in policy appraisals. If we accept that equal real resources (e.g. time) may not have equal opportunity costs to different groups in society, then policy appraisals should investigate the full range of cost and benefits, direct and indirect, accruing to all key actors, identifying differences between them, even if small. Cumulative, small changes at the individual level potentially affect the implementation and efficiency of policies at the societal level. Only when we include such costs can we adopt a truly societal perspective and consider the distributional and

equity implications of changing policies, and their likely effects on successful implementation, alongside insight regarding how to better tailor and target future policies.

There is also much scope to explore the relevance and importance of less tangible costs and benefits in users' decisions to access medicines. The current study may be criticised for being conducted in a narrow consequentialist manner, focusing only on tangible effects. Yet, a much broader range of costs and benefits may be relevant within patients' utility functions, often less tangible but still worthy of investigation (e.g. the value of information, reassurance and anxiety) (Ryan, 1992; Tymstra, 1986; Tymstra, 1987; Botkin & Alemango, 1992; Berwick & Weinstein, 1985; Mooney & Lange, 1991). It is necessary to consider all potential sources of (dis)utility relevant to individual choices about accessing medicines. Future research in this area must avoid tunnel vision and cast the appraisal net wider to include these. Greater effort is required to identify attributes important to users in their decisions about accessing medicines, the relative weights they attach to them, potential trade-offs that exist between them and their influence on decision making. The extent to which this might be expected to influence the magnitude or direction of the current study is unknown. Regardless, such research would improve our understanding is user behaviour and choice in this area.

Detailed economic appraisal of the role of community pharmacists is also necessary (Bloor, 1997). Bero et al., (1997) highlight the lack of systematic reviews investigating the effects of the extended roles of pharmacists on the process, costs and outcomes of health service delivery. Questions regarding whether the profession can provide equivalent care compared with other health professionals and the relative costs and benefits of doing so are critical, yet unanswered (Bero et al., 1997; Mays, 1994). Redressing these gaps in the evidence will be crucial if the pharmacy profession is to promote its enhanced role based firmly on evidence based practice (Bond, 2000).

Mixed method approaches, combining both qualitative and quantitative tools, are likely to be very useful in developing a fuller understanding of complex user preferences and choices in accessing P medicines in primary care. Indeed, there is growing support in the literature advocating the use of mixed methods in health services research (Baum, 1995; McKeganey, 1995; Brannen, 1992; Mason, 1994; Milburn et al., 1995). Baum notes, 'given the complexities of most contemporary public health problems, researchers need all the methodological variety they can muster to be effective' (Baum, 1995). A recent review of research and development within community pharmacy concurs, highlighting the important role multi-disciplinary research will play in the development of the profession (Bond, 2003).

Qualitative methods could be productively applied to investigate the extent to which P medicines are considered important or unimportant commodities by different user groups; to tease out the importance of structural and institutional factors on individuals' choices in relation to how they access P medicines; and more comprehensively identify and measure the full range of costs and benefits relevant to different actors. They may also be helpful in relating user preferences to context, within a broader institutional analysis, providing rich understanding of the impact of policy on users. Further, they may also assist in the design of more sensitive quantitative preference elicitation instruments e.g. discrete choice experiments to investigate particular user preferences or choices more fully (Ryan, 1996; Ben-Akiva, 1985).

Finally, future research investigating the relevance of time on user substitution decisions in accessing P medicines would be useful. Data collection pertaining to complete episodes and management of illness over time, as opposed to isolated snapshots describing service use independent of illness, is necessary (Bentzen, 1989). Longitudinal investigation of the use of P medicines in primary care would: assist in teasing out the meaning of substitution, investigating the validity of the point versus period substitution concepts across different users, minor illness and medicine groups; thoroughly investigate new versus old demand issues; and more clearly define the

substitution concept, its aims and processes, and the mechanisms considered most likely to achieve it. It would also enable collection of fuller data sets facilitating out-of sample testing and refinement of the existing model as well as more sophisticated analyses (e.g. applying multi-level-modelling techniques, combining analysis of individual level patient characteristics with small area level data, thereby potentially improving our understanding of individual consumption behaviour). This would also enable increased exploration of the relation between individual characteristics and the contextual and institutional factors that shape individual behaviour; studying levels of influence and multiple influence necessary to take forward theory development. In this way it will become possible to explore the marginal effects of certain variables and their elasticities of change, useful for considering the design of future policy.

Longitudinal analysis would also permit more in-depth consideration of issues, including a more comprehensive 'whole-systems' analysis, focusing on not only first-order effects associated with extending access to P medicines within primary care, but also second-order, knock-on effects across the health care system more generally. This would facilitate: more comprehensive analysis of any emerging variation in access and use among different user groups and enable us to learn more about users who either do not consider or who are unsuccessful in their efforts to substitute between general practitioners and community pharmacists to access P medicines; consider in more detail the true impact on primary care professionals' time; investigate impacts on patient-professional relationships; and more fully analyse the distributional implications of policies encouraging increased use of P medicines to self-medicate minor illnesses. Thus, the research agenda emerging from this research is varied, extensive and challenging.

6.5 Conclusions

The substitution hypothesis implicit in recent policies such as deregulation of medicines and encouraging increased self-medication is broadly affirmed. The majority of users buying P medicines over-the-counter from a community pharmacist appeared able to substitute this in place of accessing them from a general practitioner. Users' substitution efforts were not, however, always successful. A sizeable proportion (one in five) of users who bought their P medicine subsequently visited a general practitioner regarding the same episode of illness. In addition, key questions remain regarding what exactly constitutes substitution and its true impact on demand for primary care services. Clearer definition of the substitution concept, its aims and the mechanisms and processes considered most likely to achieve it is required.

Substitution away from general practitioners to community pharmacists to access P medicines generates a win-win situation for society overall, with all key stakeholders benefiting, on average. However, healthy more affluent users were significantly more and less affluent, iller users significantly less likely to attempt to substitute. Both total and time costs were significantly higher among those in less favourable socio-economic circumstances, who perceived themselves to be not in good health, or who were frequent users of primary care services. The crucial point is that in current policy circumstances, already disadvantaged people are further disadvantaged.

Resource savings from the substitutions are concentrated in the health sector. Users are only marginally better off, on average. They bear an increasing proportion of time and money costs and more than half of the users within the study would actually have been worse off in monetary terms. That said, their waiting times to access P medicines would have been reduced. The cost minimisation analysis demonstrates that promoting increased self-medication using P class medicines accessed from the community pharmacy could, potentially, enhance both technical and allocative efficiency within the

primary care sector, and optimise lay and professional skill mix. However, a number key issues remain unanswered. The true impact on primary care costs is unknown, as is the impact on the overall efficiency of providing first-contact care within the NHS. The policy does facilitate better access for many users and is, therefore, consonant with the government's policy objectives of encouraging enhanced, graduated access to first-contact and immediate care services. However, it may, inadvertently, be promoting differential access.

Currently, one may be forgiven for describing government efforts to enhance access to P medicines by encouraging users to buy them '**O**ver-**T**he-**C**ounter, as policy making '**O**n-**T**he-**C**heap', with users '**O**k if **T**hey have the **C**ash'. If the policy goal is to shift the resource burden associated with minor illness and first-contact care away from the NHS and onto users, then the policy may be regarded as moderately successful. However, it is not fully efficient and could potentially be introducing inequities regarding access to P medicines. Differing time and money price sensitivities exist among users. Money, rather than time prices appeared to dominate less affluent users' cost-benefit calculations. For this reason the policy, as currently formulated, does not, nor is it ever likely to, incentivise substitution among such users. The challenge facing policy makers is, therefore, to optimise the efficiency of the policy simultaneously maximising substitution potential yet avoiding the emergence of inequities in access. This may in fact be possible, if the financial obstacle to prescription-exempt users is removed. Making P medicines available free, over-the-counter at community pharmacies to prescription exempt users (with certain provisos) could, potentially, realise both objectives. Longitudinal, whole-systems analysis of any such initiatives, utilising a range of theoretical and mixed method approaches would be required, facilitating development of broader socio-economic theories of consumption for P medicines, which in turn would yield much needed insight regarding how best to tailor and target future policy initiatives in this increasingly important and pertinent health policy area.

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Accessing P Class Medicines from General Practitioners or Community Pharmacists:

Investigating User Choice, Substitution and Relative Costs Between the Two Routes

APPENDICES

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A thesis submitted in partial fulfilment of the

requirements for the degree of

Doctor of Philosophy

University of Edinburgh

College of Medicine and Veterinary Medicine

2004

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Appendix 1:

Chapter 1 - Literature

Literature Search Strategy

A literature search was undertaken using the electronic data bases 'BIDS' (Bath Information and Data Services) and 'First Search'.

BIDS

The 'IBSS Online' international bibliography of the social sciences was searched which covers the areas of economics; sociology; politics; and anthropology.

First Search

The 'Social Sciences', 'Medicine and Health Services' and 'Business and Economics' subject area data bases was searched. Within these broad subject areas, the specific data bases searched included 'WorldCat', 'Articles 1st', 'EconLit' and 'MEDLINE'.

'WorldCat' - Books and other material in libraries worldwide
'Article 1st' - Index of articles from nearly 12500 journals
'Econ Lit' - An index of economic literature
'MEDLINE' - Abstracted articles from medical journals

These databases were searched using a number of key words and authors including:

Key words/phrases: Non prescription drugs; medicine reclassifications; drug reclassification; deregulated medicines; demand for non prescription drugs; economics and prescribing; economics and pharmaceuticals; drug charges; deregulated prescribing; drug policy; prescription drugs; drug co-payments; drug cost sharing; drug price elasticity; self medication; drug switching; over-the-counter drugs; and drug deregulation.

Key authors: Huttin, Temin, Leibowitz; Ryan; Birch; Newhouse; Noyce; Bond; Bradley; Blenkinsopp; Britten; Blaxter; Cunningham-Burley; Ferner; O'Brien; Reez; and Kennedy.

Literature Search Strategy continued

The literature search was continued, using the same electronic databases as before. However, the focus of this search was methods/concepts/journals and so mainly focused on the 'EconLit', 'Article 1st' and 'Contents 1st' data bases using BIDS and First Search. The period of review was the whole span of the electronic databases. In general though, this involved usually from 1990 onwards at least. For the search of Journals contents pages through 'Contents 1st' the review period was often longer.

The key **methods** and **concept** terms searched under and the number of hits for each are outlined below:
Economic substitution and health (25)
Medical firm (125)
Principal agent theory (193)
Health care demand functions (8)
Expected utility theory (789)
Costs and benefits and health (276)
Welfare economics (1240)
Welfare economics and health (8)
Consumer surplus analysis (115)
Economic decision-making (383)
Stated preference theory (13)
Conjoint analysis (55)
Substitution (25)

Search on **journal contents pages** as follows:
Pharmacoeconomics (1995-97, 43 issues)
Health Economics (1995-97, 87 issues)
Journal of Health Economics (1990-97, 34 issues)
Journal of Law and Economics (1992-97, 48 issues)
Bell Journal of Economics (1990-97, 32 issues)
Journal of Economic Theory (1993-97, 37 issues)
Journal of Political Economy (1993 -97, 96 issues)
American Economic Review (1992 -97, 27 issues)
Journal of Economic Literature (1986-97)

Search on **authors** included:
Christine Godfrey (7 hits); Graham Loomes (33 hits); John Hey (62 hits)

Quality Criteria Applied to the Literature
It was difficult to apply formal quality assessment criteria to the literature retrieved. A diverse range of literature was searched and sourced and the researcher was keen to be as inclusive as possible, including a range of papers (including various types of primary and secondary research studies, comment, think and editorial pieces) both published and unpublished (e.g. reports and other grey sources) as well as literature from different subject areas and countries. Efforts to maintain quality of literature for inclusion were, however, taken, by searching for literature in quality, peer reviewed journals, by respected authors and canvassing colleagues views expert in related

subject areas. Thus, quality review of the literature included in the research was ultimately at the discretion of the researcher, who was mindful of the hierarchy of evidence and good practice principles applied by respected literature review organisations (e.g. the Cochrane Collaboration).

TABLE A1.1: CHECKLIST FOR ASSESSING ECONOMIC EVALUATIONS

1. Was a well-defined question posed in answerable form?

- 1.1 Did the study examine both the costs and effects of the service/programme?
- 1.2 Did the study involve a comparison of alternatives?
- 1.3 Was a viewpoint for the analysis stated and was the study placed in any particular decision-making context?

2. Was a comprehensive description of the competing alternatives given?

- 2.1 Were any important alternatives omitted?
- 2.2 Was (should) a do-nothing alternative (be) considered?

3. Was the effectiveness of the programme or service established?

- 3.1 Was this done through a randomised, controlled clinical trial? If so, did the trial protocol reflect what would happen in regular practice?
- 3.2 Was effectiveness established through an overview of clinical studies?
- 3.3 Were observational data or assumptions used to establish effectiveness? If so, what are the potential biases in the results?

4. Were all the important and relevant costs and consequences for each alternative identified?

- 4.1 Was the range wide enough for the research question at hand?
- 4.2 Did it cover all relevant viewpoints? (Possible viewpoints include the community or social viewpoint, and those of patients and third-party payers. Other viewpoints may also be relevant depending upon the particular analysis).
- 4.3 Were capital costs as well as operating costs considered?

5. Were costs and consequences measured accurately in appropriate physical units (e.g. hours of nursing time, number of physician visits, lost work-days, gained life years)?

- 5.1 Were any of the identified items omitted from measurement? If so, does this mean that they carried no weight in the subsequent analysis?
- 5.2 Were there any special circumstances (e.g. joint use of resources) that made measurement difficult? Were these circumstances handled appropriately?

6. Were costs and consequences valued credibly?

- 6.1 Were the sources of all values clearly identified? (Possible sources include market values, patient or client preferences and views, policy makers' views and health professionals' judgements).
- 6.2 Were market values employed for changes involving resources gained or depleted?
- 6.3 Where market values were absent (e.g. volunteer labour) or market values did not reflect actual values (such as clinic space donated at a reduced rate) were adjustments made to approximate market values?
- 6.4 Was the valuation of consequences appropriate for the question posed (i.e. has the appropriate type or types of analysis – cost effectiveness, cost benefit, cost utility – been selected)?

7. Were costs and consequences adjusted for differential timing?

7.1 Were costs and consequences which occur in the future 'discounted' to their present values?

7.2 Was any justification given for the discount rate used?

8. Was an incremental analysis of costs and consequences of alternatives performed?

8.1 Were the additional (incremental) costs generated by one alternative over another compared to the additional effects, benefits, or utilities generated?

9. Was allowance made for uncertainty in the estimates of costs and consequences?

9.1 If data on costs and consequences were stochastic, were appropriate statistical analyses performed?

9.2 If a sensitivity analysis was employed, was justification provided for the ranges of values (for key study parameters)?

9.3 Were study results sensitive to changes in the values (within the assumed range for sensitivity analysis or within the confidence interval around the ratio of costs to consequences)?

10. Did the presentation and discussion of the study results include all issues of concern to users?

10.1 Were the conclusions of the analysis based on some overall index or ratio of costs to consequences (e.g. cost effectiveness ratio)? If so, was the index interpreted intelligently or in some mechanistic fashion?

10.2 Were the results compared with those of others who have investigated the same question? If so, were allowances made for potential differences in study methodology?

10.3 Did the study discuss the generalisability of the results to other settings and patient/client groups?

10.4 Did the study allude to, or take account of, other important factors in the choice or decision under consideration (e.g. distribution of costs and consequences, or relevant ethical issues)?

10.5 Did the study discuss issues of implementation, such as the feasibility of adopting the 'preferred' programme given existing financial or other constraints, and whether any freed resources could be redeployed to other worthwhile programmes?

Sourced from Drummond et al., 1997

TABLE A1.2: CHRONOLOGY OF INITIATIVES ASSOCIATED WITH EXTENDING THE ROLE OF COMMUNITY PHARMACISTS*

Year(s)	Initiative	Contribution
1979	**Royal Commission on the NHS**	Highlighted the under-utilisation of the pharmacy profession.
1980s	Research efforts	Expansion in pharmacy practice research activities.
1980s	Limited number of **drug deregulations**	Increasing availability of proprietary medicines e.g. ibuprofen and loperamide, terfenadine and topical hydrocortisone reclassified from prescription only to pharmacy available status in 1983, 1984 & 1985 respectively.
1982	National Pharmaceutical Association **"Ask Your Pharmacist"** campaign	Publicity campaign aiming to advice the general public of community pharmacists' expertise in medicines and to encourage them to seek their advice.
1983	**Nuffield Committee Inquiry** commissioned	Government sponsored the Nuffield Foundation to consider the future of pharmaceutical services and, in particular, to consider: the structure of the profession; its potential contribution to the NHS and health care; and to review pharmacists' education and training.
1985	**Selected List** of medications introduced within the NHS	Government compiled a list of the preparations to be included and excluded from NHS prescribing.
1986	**Nuffield Committee Inquiry Report**	Concluded that pharmacists were under-utilised. Produced detailed suggestions regarding extending and developing their role, recommending that their contribution as: experts in medicines; advisers to both patients and other professionals; providers of specialist services; and engaging in health promotion activities be increasingly utilised within the NHS. Around this time the primary care demand management agenda begins to implicitly emerge and gather momentum.
1987	**European Commission review of medicines status**	Intention to harmonise the distribution of medicines within Europe and achieve consistency in availability across member states.
1987	**Promoting better health** (Department of Health)	Endorsed the recommendations of the Nuffield Inquiry and suggested closer involvement of pharmacists in efforts to improve primary health care service offered to patients. Key suggestions included: delegating dispensing activities to trained technicians, freeing up pharmacists to

		undertake new roles including patient medication reviews and providing pharmaceutical services to nursing homes. Additional remuneration recommended for these new roles.
1989	**WHO report** on the role and function of pharmacists in Europe	Function and responsibility of pharmacists within industrialised health care systems defined and recommendations for potential developments made.
1989	**Working for patients** (Department of Health)	Proposals to improve patient health care, enhancing access and choice of services, alongside proposals to improve the satisfaction and remuneration for NHS professionals responding to local needs. Identified potential for pharmacists to be involved in managing NHS drug expenditure.
1991	**Health of the nation** (Department of Health)	Advocated a primary care led NHS and outlined the potential merits of encouraging community pharmacy to become more actively involved in health promotion activities.
1992	**Pharmaceutical care: the future for community pharmacy**. Royal Pharmaceutical Society & Department of Health, joint working party report.	Endorsed the extension of community pharmacy roles as experts in medicines, in the provision of specialist services and health promoting activities.
1992	**European Commission Directive 92/96**	Obliged member states to review the legal classification of medicines every 5 years. Prescription only classification to be enforced only if medicines are dangerous, if used without supervision; often used incorrectly; new medicines (for 2 years and then reviewed); or normally injected. Deregulation criteria include that the drug should be proven to be safe; of low toxicity in overdose; and suitable for the treatment of minor self-limiting conditions.
1992	**Medicines Control Agency** increased deregulations	An increasing number of medicines reclassified, with over 40 POM to P deregulations up to 1995. Enhanced consumer self-medication options.
1995	**PIANA – Pharmacy in a New Age** (Royal Pharmaceutical Society)	Professional engagement exercise: debating the features shaping community pharmacy; agreeing on future professional directions; and developing an agenda for change. Supported the extension of the role of pharmacists. 4 key areas where pharmacists' contribution identified as vital including: management of

		prescription medicines; management of chronic conditions; management of common ailments; and the promotion of healthy lifestyles. Commitment to enhance the role of community pharmacists within primary health care teams and review alternative remuneration options with a view to encouraging extended provision of services to local communities.
1995	**Written protocols** required in pharmacies	Written protocols outlining the procedure to be followed in pharmacies when a medicine is supplied or advice on the treatment of a medical condition is sought.
1996	**Medicine counter assistants training requirements**	Each member of staff involved in the sale of medicines now required to undertake specific training.
1996	**The NHS: a service with ambitions** & **Choice and Opportunity: primary care the future** (Department of Health)	Re-emphasis of the primary care led NHS. Multidisciplinary team working to be a key feature with community pharmacists included as an integral member of primary health care teams. Unequivocal support for community pharmacy to be seen as the 'first port of call' in the management of minor ailments.
1997	**Primary care: agenda for action** (Department of Health)	Scottish development programme for primary care. Explicit aim to engage and develop community pharmacy capacity.
1997	**Primary care: delivering the future** (Department of Health)	Community pharmacy encouraged to become involved in reducing drug wastage in the NHS. Greater collaboration with patients and between professionals to enhance concordance in medicine usage.
1997	**The new NHS: modern and dependable**; **Designed to care: renewing the NHS in Scotland**; & **NHS Wales: putting patients first** (Department of Health & Scottish Executive)	Once again emphasising the pivotal role of primary care in the NHS. Identified individuals as partners in health care decision-making. Supporting self-care via efforts to improve access to primary care services e.g. through NHS Direct and NHS 24. Around the time of these White Papers, academic and policy debates shift perceptibly, moving away from narrow demand containment to broader concerns to effect more appropriate, graduated access to primary care services.
2000	**The NHS plan: a plan for investment, a plan for reform** (Department of	Addressed the issue of a wider role for pharmacists. Flagged up the necessity to change the contractual and remuneration arrangement for community pharmacists.

	Health)	
2001	**Local Improvement Finance Trust** Department of Health)	Government proposals to modernise primary care premises. Opportunity for pharmacists to improve their premises, move to new ones or co-locate with general practitioners and/or other primary care professionals.
2002	**Pharmacy in the future: implementing the NHS plan** (Department of Health)	Outlined a number of proposals to improve access to and quality of pharmacy services, including: ensuring that people can get medicines or advice from a pharmacist easily, at convenient times; providing more support in using medicines; and increasing public confidence in consulting with pharmacists. Specific improvements to include: increasing the range of medicines available without a prescription; management of repeat prescription dispensing; improving out of hours access to pharmacy advice e.g. via NHS Direct; increasing the opening hours of community pharmacies; and involving community pharmacists in one-stop care centres.
2003	**The right medicine: a strategy for pharmacy care in Scotland** (Scottish Executive)	Recommendations included: encouraging community pharmacies to carry the NHS Scotland logo; improving community pharmacy premises e.g. increasing consultation areas; improving access, especially out of hours; improving patient medication records; electronic transfer of prescriptions nationwide; management of repeat prescription dispensing; enhancing therapeutic roles; introducing supplementary prescribing status; and developing remuneration systems to allow health boards to contract directly with community pharmacists for the provision of specialist services.
2003	**A vision for pharmacy in the new NHS** (Department of Health)	Community pharmacies to become a more integral part of the NHS to: be more engaged with primary care trusts and involved in the planning and development of local services; be more clearly integrated with general practices and support the new GMS contract; help deliver National Service Frameworks; help redress health inequalities, particularly for deprived groups; provide diagnostic and monitoring services; and improve public access to services.
2003	**Office of Fair Trading report**	Call for controlled entry of community pharmacies within areas to be scrapped. Government rejected. However, proposed easing restrictions in large shopping developments and for community

		pharmacies planning to open for more than 100 hours per week.
2003	**Framework for a new community pharmacy contract** (Department of Health)	Aim to assist the modernisation of community pharmacy through the introduction of a new contractual framework in 2004. Contract to be designed to establish minimum standards and outline essential, advanced and supplemental services and appropriate remuneration for each. The goal is to reward quality services and move away from payment based solely on the volume of prescriptions dispensed. Seeking to reward broader professional activities associated with community pharmacists' extended roles.

* This table draws on and expands previous chronologies of related events outlined by Bond, 2000 and Vallis, 1998. In addition, it draws on several policy documents, including: Department of Health 1987; 1989; 1991; 1992a; 1992b; 1996a; 1996b; 1997a; 1997b; 1999; 2000; 2002a; 2002b; 2002c; 2003a; 2003b; Royal Pharmaceutical Association of Great Britain 1986; 1992; 1994; 1996; 2001; Scottish Executive 1997; 2003; Secretary of State for Scotland 1997; Secretary of State for Wales 1997; Merrison, 1979; Harrison, 2001; and NHS Confederation, 2003.

TABLE A1.3: POTENTIAL ADVANTAGES AND DISADVANTAGES TO USERS, GENERAL PRACTITIONERS AND COMMUNITY PHARMACISTS ASSOCIATED WITH THE INCREASING AVAILABILITY OF MEDICINES, FROM A SOCIAL, CLINICAL AND ECONOMIC PERSPECTIVE.

SOCIAL DIMENSION: USERS	
POTENTIAL COSTS	**POTENTIAL BENEFITS**
• Potential externality problems e.g. increases in drug resistant organisms (Hollis-Triantafillou, 1996; Temin, 1983). • Use of P drugs to contain symptoms as an alternative to necessary lifestyle modifications (Ross, 1996). • Changes in the culture and use of medicines e.g. increased reliance on drugs and 'pill for every ill' (Ferner, 1994; Bradley & Bond, 1995) or over dependency on drugs with users becoming 'slaves to medications.' (Blaxter & Britten, 1996). • Loss of social interaction benefits received during the GP consultation process e.g. loss of doctors reassurance and/or medical legitimation of users illness (Blaxter & Britten, 1996; Cunningham-Burley & MacLean, 1987). • Increased anxiety associated with increased information available on P drugs (Blaxter & Britten 1996). • Potential development of inverse care scenarios in pharmacies, relating to difference in the environment in which community pharmacies are located and organised, that influence the type of services provided to local populations. Concerns that large differentials in range, quality and type of services provided to users may emerge (Rogers, Hassell & Nicolass, 1999).	• Increase in user empowerment, choice and autonomy (Blaxter & Britten, 1996; Erwin, Britten & Jones, 1997; Bond and Bradley, 1996; Bradley and Bond, 1995). Enhanced user knowledge and value of information per se that is potentially reassuring to users (Mooney & Lange, 1993; Mooney, 1994). • Individuals have more opportunity to take responsibility for their own health, illness and symptoms resulting in increases in users' self-legitimation and confidence in self-diagnosis and treatment (Blaxter & Britten, 1996). • Engagement of lay beliefs can contribute to involving users in evidence-based research, potentially resulting in more effective services (Blaxter & Britten, 1996). • Enhanced user convenience associated with more direct access (Hassell et al., 1996; Kennedy, 1996). • Convenience associated with users' ability to increasingly engage in proxy consultations for someone else (Temin, 1983; Hassell et al., 1996; Hassell et al., 1997; Hassell et al., 1998; Rogers, Hassell & Nicolass, 1999; Whittington et el., 2001). • Redressing power relations between users and health professionals. • Declining paternalism (Andersen & Schou, 1994) and the potential to develop more equal partnerships (Blaxter & Britten, 1996) balancing self and medical legitimation of symptoms and illness (Cunningham-Burley & McLean, 1987). • Medicines are seen as essentially democratic which is particularly useful for users with a low faith in traditional medical services (Blaxter & Britten, 1996). • Pharmacists perceived to have more time and empathy with users and there is the advantage that users can remain relatively anonymous in pharmacy consultations (Blaxter & Britten, 1996; Hassell et al., 1996; Hassell et al., 1997; Griffin, 1994). • Potential to lead to more efficient and appropriate utilisation of primary care

	services (Hassell et al., 1996; Blaxter & Britten, 1996; Temin, 1983). • Users encouraged to tap the expertise of pharmacists in medicines, a currently underused advice source. Ultimately encouraging more rational use of services via a 'stepping stone approach', resulting in more appropriate utilisation of services and the generation of caring externalities associated with users feeling good about not wasting or taking up GPs time for those in more need (Cunningham-Burley & MacLean, 1987; PAGB, 1994; Hassell et al., 1997; Hassell et al., 1998; Rogers, Hassell & Nicolaas, 1999; Whittington et al., 2001).
CLINICAL DIMENSION: USERS	
POTENTIAL COSTS	**POTENTIAL BENEFITS**
• Potential increases in the number of adverse drug reactions, contra-indications and side effects (Bradley & Bond, 1995; Temin, 1983). • Cynicism among users regarding the efficacy of non-prescription medicines, with many believing that medicines from doctors are 'stronger' (Hassell et al., 1998). • Concerns regarding inappropriate and/or over utilisation of medicines leading to concerns regarding developing 'immunities' in the population (Hassell et al., 1998). • Potential masking of serious symptoms and associated problems with late diagnosis (Bond et al., 1993; Erwin, Britten & Jones, 1997; Comment, 1994). • Reservations that pharmacists are not trained to diagnose, alongside their inability to consult users' medical records (Vallis, Wyke & Cinningham-Burley, 1997; Hassell et al., 1998). • Privacy concerns, as there are usually no dedicated consulting areas within community pharmacies (Hassell et al., 1998; Whittington et al., 2001). • Inappropriate use of P products to contain symptoms as an alternative to necessary lifestyle modifications (Ross, 1996). • Doubts regarding user competence in self-care (Blenkinsopp & Bradley, 1996). Danger of inadequate self-diagnosis and inappropriate self treatment (Erwin, Britten & Jones, 1997) e.g. via erroneous choice of P drugs (Hassell at al., 1996). Concern	• Encouragement of different approaches to diagnosis and use of services (Blaxter & Britten). • A 'stepping stone' approach (Cunningham-Burley & MacLean, 1987) seeking legitimation of illness before attending a GP (Blaxter & Britten, 1996). • Using medicines to trial the meaning of symptoms and for interrogating what they understand about their doctor's or their own diagnosis (Blaxter & Britten, 1996). • Increasing availability of information is reassuring for users (Mooney & Lange, 1993; Mooney, 1994). • Ability to use the pharmacist as an information source, tapping their experience and expertise in medicines (Hassell et al., 1996; Hassell et al, 1998). • More informal consultation process within pharmacy (Hassell et al., 1996). • Users are able to remain more anonymous and to ask advice without feeling obliged to accept it (Temin, 1983). • More open consultation, leading to users potentially revealing symptoms or side effects that they would not reveal to their doctor (Temin, 1983).

that information on P drugs is largely promotional, making rational choice at the point of sale is impossible for most lay people Herxheimer & Britten, 1994). • Danger of inadequate advice from the pharmacists (Comment, 1994).	
CLINICAL DIMENSION: GENERAL PRACTITIONERS	
POTENTIAL COSTS	**POTENTIAL BENEFITS**
• Potential for increases in drug resistant organisms (Hollis-Triantifillou, 1996; Ward et al., 1997). • Reductions in consultations mean curtailed opportunities for GPs to pursue opportunistic counselling about lifestyle and other health promoting activities (Blaxter & Britten, 1996; Kennedy, 1996; Bradley & Bond, 1995). • Loss of the broader social interaction process around the GP consultation (Temin, 1983). Potential reduction in traditional continuity of care aspect of general practice. Change in the traditional doctor-patient relationship. • Surrendering a degree of professional power that is often unwelcome (Erwin, Britten & Jones, 1997; Blenkinsopp & Bradley, 1996; PAGB, 1994). • Uncertainty among GPs about the appropriateness of pharmacy advice or referral decisions (Hassell et al., 1996).	• Potential decreases in GPs workload (Kennedy, 1996) particularly for minor ailments, leaving more time to spend on needier patients (Ryan & Yule, 1990). • More appropriate use of the relative skills and knowledge base within primary care (Erwin, Britten & Jones, 1997). • Potential for pharmacists to become proactive advisers of patients and doctors with improvements in clinical practice as a result (Kennedy, 1996).
CLINICAL DIMENSION: COMMUNITY PHARMACISTS	
POTENTIAL COSTS	**POTENTIAL BENEFITS**
• Concerns regarding the appropriateness of referral and advice giving decisions by pharmacists (Hassell et al., 1996; Griffin, 1994; Comment, 1994). • Spot diagnosis, in the absence of user history or access to medical records can be very difficult. Danger of suspicion rather than diagnosis (Hassell et al., 1996). Adequacy of the training of pharmacists to perform an extended advisory and diagnostic role? (Hassell et al., 1996) • Advice giving can be particularly difficult if by proxy and more so if the drugs concerned are the subject of conjecture by the proxy (Hassell et al., 1996). • Danger that there is insufficient time within a pharmacy consultation to perform an advisory or diagnostic role to a satisfactory standard. Typically, pharmacies not set up for these roles e.g. often a physical barrier of a counter between the pharmacist and the user and	• Added value from pharmacy care and advice, as they are the experts in medicines. Becoming a more formal player within a natural hierarchy of advice (Hassell et al., 1996) that is leading to more appropriate use of the relative skills and knowledge within primary care (Ferner, 1994; Davey et al., 1996). • Pharmacists offer the potential to adopt a more proactive gatekeeper role into general practitioner services (Hassell et al., 1996). • Pharmacy consultations tend to be more open and less threatening to users and their relative anonymity could be seen as an advantage. Lay people perhaps more willing to reveal symptoms and side effects that they choose not to reveal to their doctors (Blaxter & Britten, 1996). • Increased opportunity to become more involved in health promotion (Ross, 1996; Bond & Bradley, 1996) and to extend their professional role more

the consultations tend to be of a very public nature that can impede advice giving (Hassell et al., 1996). • Help on demand re P drugs can be a barrier to the pharmacist's advisory role (Hassell et al., 1996; Temin, 1983; Reez & Melzack, 1994). • Danger of compromising pharmacists professional relationship with users e.g. in dealing with 'determined purchasers' who are very difficult to advice. Danger of jeopardising relationship if the pharmacist questions the appropriateness of the users use of a drug (Hassell et al., 1996). • P drug sales involve a product recommendation that is complicated by incentives for pharmacists to be tempted to profit maximise (Hassell et al., 1996). • Pharmacists anxious about increasing responsibility (Bradley & Bond, 1995). Increasing consumer expectations of the pharmacists. Can pharmacists realistically be expected to meet them? (Ashurst & Smith, 1997).	generally (Bradley & Bond, 1995; Kennedy, 1996; Bond et al., 1993). • Opportunity for pharmacists to develop much closer partnerships with users (Ashurst & Smith, 1997). • Opportunities to facilitate closer cooperation between pharmacists and other primary health care professionals (Ashurst & Smith, 1997). • More job satisfaction (Ashurst & Smith, 1997). • Increasing status for pharmacists within the medical division of labour (Ward et al., 1997).
ECONOMIC DIMENSION: USERS	
POTENTIAL COSTS	**POTENTIAL BENEFITS**
• Retail cost of the P product (Ryan & Yule, 1990). • Concerns regarding whether purchasing medicines is affordable to all, especially low- income groups (Rogers, Hassell & Nicolaas, 1999; Whittington et al., 2001). • Travel costs to the pharmacy (Ryan & Yule, 1990). • Potential increases in morbidity and associated loss of productive time if users delay consulting a GP (Ryan & Birch, 1991). • Cost to consumer of switching or substituting other health care services in place of both the GP and the pharmacist e.g. increased use of A&E services (Leibowitz, 1989).	• Savings to users in time costs in terms of travel, waiting and consultation times. Savings also in reduction in loss of time at work (Bradley & Bond, 1995; Kennedy, 1996; Ryan & Yule, 1990; Temin, 1983). • Savings to consumers in money costs i.e. travel expenses and prescription charges (for non-exempt users) and through reductions in time lost at work (Bond et al., 1993; Temin, 1983; Ryan & Yule, 1990; Hassell et al., 1996). • Enhanced user convenience (Thomas & Noyce, 1996; Baines & Whynes, 1997; Hassell et al., 1997; Hassell et al., 1998; Varnish, Jesson & Wilson, 1998; Rogers, Hassell & Nicolaas, 1999; Whittington et al., 2001). • Allows users to balance perceived costs and benefits (Blaxter & Britten, 1996; Cunningham-Burley & MacLean, 1987).
ECONOMIC DIMENSION: GENERAL PRACTITIONERS	
POTENTIAL COSTS	**POTENTIAL BENEFITS**
• Potential for duplication in advice and consultation services between the GP and the pharmacist. • Increased volume of work and job stress associated with keeping abreast of patients' use of P as well as prescription	• Savings on the direct and indirect costs of dispensed drugs e.g. on the practice drug budget (Andersen & Schou, 1994). • Reduction in workload associated with minor ailments as pharmacist help to keep this out of general practice (Hassell

drugs. • Difficult for GPs to resist patients demands for least cost effective, brand drugs which they have previously experimented with via P availability. Danger that the users choice of drug is sub-optimal both in clinical and cost effectiveness terms (Bradley & Bond, 1995). • Potential medico-legal implications of increased P usage (Bradley & Bond, 1995; Thomas & Noyce, 1996; Griffin, 1994).	et al, 1996). • More efficient division of labour and skill mix (Hassell et al. 1996; PAGB, 1994). Opportunity to develop more complementary service provision between GPs and pharmacists, cutting out any unnecessary duplication and potentially reducing GPs workload (Bond et al., 1993). • Enhanced professional satisfaction associated with the reduction in the amount of self limiting, minor illness presenting in general.
CLINICAL DIMENSION: COMMUNITY PHARMACISTS	
POTENTIAL COSTS	**POTENTIAL BENEFITS**
• Unpaid for their advice-giving role re P drugs. So, opportunity costs of the pharmacist's time (Hassell et al., 1996). • Potential duplication of advice and consultation services within primary care. • Exposure to more risk and responsibility as a result of the increased advisory role re P drugs (Ashurst & Smith, 1997). • Anxieties about increased role (Bradley & Bond, 1995). • Medico-legal implications (Griffin, 1994; Baines & Whynes, 1977). • Increased workload and stress for pharmacists. • Temptation to follow business interests first i.e. pursue profit maximisation over users welfare (Blenkinsopp & Bradley, 1995; Hassell et al., 1996).	• Benefit from typically increased profit margins on P drug sales compared to the prescription-dispensing fee (Ferner, 1994). • More efficient division of labour and skill mix. Opportunity to develop more complementary services between GPs and pharmacists and to cut out any unnecessary duplication (Ferner, 1994; Hassell et al., 1996). • Added value of the pharmacist's advice as an expert in medicines.

Appendix 2:

Chapter 2 - Methods

? April 1998

Dear ,

Deregulation of Medicines Research Project:
Request for Participation as a Study Pharmacy

I am writing to invite you to take part in a community pharmacy research project. I telephoned your pharmacy when you were on holiday (07.04.98) and they suggested that I send you on some information. I include a leaflet that summarises the research project and a copy of the draft questionnaire that I hope to administer within your pharmacy. I also enclose a leaflet that will be given to users following their interview.

I would like to spend ten days within your pharmacy to undertake this questionnaire. Your participation would require the pharmacist/pharmacy assistant(s) introducing users of deregulated 'P class' medicines to the study (whether obtained on prescription or over-the-counter) and asking them to participate. In addition, it would be helpful if you could also tell me directly the name of the deregulated medicine that I would be questioning the user about, to ensure that I have an accurate record. Thereafter, I will undertake the short questionnaire with the user. This will involve them answering a maximum of 26 short and mainly factual questions. I anticipate that this should take no more than 5 - 10 minutes, maximum.

The project will begin in June and fieldwork undertaken in the following six months. The ten days data collection period within your pharmacy will be arranged at convenient times, in consultation with you.

Thank you very much for taking the time to consider participation in this study. I am on holiday from 9th - 20th January. I shall telephone you on my return to discuss the project with you further. The project is being undertaken with the support of Dawn Sykes, Lothian Health's Pharmacy Facilitator. If you would like to discuss the project with Dawn she is happy for you to contact her (Tel: 0131 536 9303). I hope that you will consider participating.

Best wishes,

Yours sincerely,

Susan Myles

May 1998

Dear ,

Deregulation of Medicines Research Project:
Proposed Fieldwork Dates

Further to our recent telephone conversation (20.04.98) I am writing to suggest fieldwork dates to visit your pharmacy to undertake data collection. Based on your planned holiday dates and preferred times, I propose that we visit you on the two consecutive weeks of **June 29th - 4th July** and **July 6th - 11th**. I hope that these two weeks will be convenient for you. If not, I can arrange alternate dates. I will telephone you in the next week to confirm the dates. If they are suitable I will make an appointment to visit you shortly before the data collection period to introduce the member of the research team who will be visiting your pharmacy and to discuss any queries you may have about the project.

I would like to thank you in advance for agreeing to take part in this study. Your participation is of great value and is much appreciated by the research team.

I look forward to talking to you and meeting you soon.

Best wishes,

Yours sincerely,

Susan Myles

MEDICINES FROM THE DOCTOR OR PHARMACIST? AN ASSESSMENT OF THE COSTS AND BENEFITS

INTRODUCTION

Medicine deregulation has been enthusiastically embraced within the UK in recent years. A key assumption underpinning this has been the belief that increasing the availability of 'P' class medicines via deregulation offers potential to secure savings for the NHS, as consumers increasingly self medicate and bear the cost of minor illness. However, this assumption is unfounded in evidence. Research is necessary to provide evidence on the impact of drug deregulation and the associated increase in availability of 'P' class medicines, analysing changes in the distribution of costs and benefits accruing to key stakeholders as a result. This information is urgently required to help users, pharmacists, general practitioners and health policy makers to make informed choices about the appropriate provision and classification of different types of medicines. Thus, the Medical Research Council has funded the research project outlined below, to investigate these issues. This research is being carried out by the Department of General Practice at the University of Edinburgh, between spring 1998 and autumn 2000.

STUDY AIM AND OBJECTIVES

AIM

The overall aim of this research project is to assess the extent to which increasing availability of 'P' class medicines results in substitution or complementary usage between general practice and community pharmacy services, investigating the direct and indirect costs and benefits accruing to users, community pharmacists and general practitioners as a result.

OBJECTIVES

- To describe the consultation career paths adopted by users to access 'P' class medicines, assessing the extent of substitution or complementary usage between general practice and community pharmacy services.

- To identify the full range of social, clinical and economic costs and benefits for users, pharmacists and general practitioners associated with different consultation career paths.

- To investigate the welfare implications, at both the micro (individual) and macro (health policy) levels of the changing distribution of costs and benefits associated with the increased availability of 'P' class, medicines.

METHODS

A two year cross sectional descriptive study, with prospective follow up of users. The study will be based within the Lothian Health Board area. Three key data collection methods will be employed.

- ***Short interviews*** - conducted with users in community pharmacies, at the point of purchase or dispensing of 'P' class medicines, to collect information on users' consultation career paths through general practice and community pharmacy services to date.

- ***Telephone interviews*** - following up users, to collect data on subsequent use of general practice or community pharmacy services and to assess users' perceptions of associated costs and benefits.

- ***Postal surveys**** - across a representative sample of community pharmacists and general practitioners within the Lothian Health Board area, to assess their perceptions of the costs and benefits associated with the increased availability of 'P' class medicines.

DISSEMINATION

The full report will be available in October 2000. An interim report will be produced in March 1999.

CONTACT

This research project is being undertaken by the Department of General Practice at the University of Edinburgh. Any queries about the project should be addressed to the lead researcher, Susan Myles, at the contact address below:

Susan Myles
Department of General Practice
University of Edinburgh
20 West Richmond Street
Edinburgh
EH8 9DX

Tel: 0131 650 2682
Fax: 0131 650 9119

*Note: Postal surveys were not conducted.

MEDICINES FROM THE DOCTOR OR THE PHARMACIST?

A RESEARCH STUDY

Researchers from Edinburgh University are looking at the costs and benefits to people of getting certain medicines which can be got either from the general practitioner on prescription, or bought from the pharmacist over-the-counter.

This pharmacy has been chosen as a study site for the research project. If you buy or collect a prescription for certain medicines you may be asked by the pharmacist or assistant to take part in a short 5 minute interview with a researcher visiting the pharmacy today.

PLEASE NOTE: all information you share with the researcher will be strictly **CONFIDENTIAL** and seen only by researchers. Taking part in the study will not affect the treatment you receive.

Your opinions are very valuable to the research and should help to guide new policy on medicines. We hope that you will want to take part.

Thank you very much for your help

Deregulation of Medicines Project - Contact Details

In the event of any queries or problems arising please contact:

Susan Myles
Dept. of General Practice
Primary Care Research Group
20 West Richmond St
Edinburgh
EH8 9DX
Tel: 0131 650 2682
Fax: 0131 650 9119

Messages can also be left for Susan with Fiona Bell (Project Secretary) on 0131 650 2680/2682

Alternately, you can contact Susan at home:

21 Grange Place
Cherrytree Grove
Grangemouth
FK3 9JQ
Tel/Fax: 01324 486517

If Susan is unavailable then please contact:

Dr Sally Wyke
Senior Research Fellow
Dept. of General Practice
Primary Care Research Group
Tel: 0131 650 2680

Dr Jacqueline McDonald
Medical Secretary
LAMC RCGP
2 Hill Square
Edinburgh
EH8 9DR

Dear Dr McDonald,

Notification of Research Project - "Reclassification of Medicines: An Assessment of the Costs and Benefits"

I am writing to you to inform the LAMC and its members about a research project about to begin within the Lothian area. I am an MRC Health Services Research Training Fellow about to embark upon a pharmacy practice research project investigating peoples' use of over-the-counter deregulated 'P' class medicines and the extent to which they substitute them in place of a consultation with a general practitioner to receive prescription drugs.

The research project has been cleared through the local ethical approval committee. It will be undertaken in 14 pharmacies across Lothian and involves a short 5 minutes interview with users at the point of collection of a P medicine within the pharmacy. The pharmacists involved and the proposed fieldwork dates at each are attached. I also enclose a copy of the project leaflets which summarise the research. If you would like any further information about this project, then please do not hesitate to contact me.

Yours sincerely,

Susan Myles

Research Project - Reclassification of Medicines: An Assessment of the Costs and Benefits

Participating Pharmacies and Provisional Data Collection Timetable

Pharmacist	Pharmacy	Data Collection Dates
Mr Brian Ferguson	B R & M L Ferguson Chemist 66 High Street, North Berwick	August 17th - 30th
Ms Julie Finneran	J Smith Chemists 58 - 60 Niddrie Mains Road, Edinburgh	September - to be confirmed
Ms Claire Hutcheon	Safeway Pharmacy Almondvale Centre, Livingston	June 22nd - July 5th
Mr Bill McFarlane	Blackfaulds Pharmacy 3 Blackfaulds Place, Fauldhouse	October 19th - November 1st
Mr Robert Thomson	Lindsay & Gilmour 105 Broughton Street, Edinburgh	June 15th - June 28th
Ms Fiona McLaren	Lindsay & Gilmour 14 Woodburn Avenue, Dalkeith	August 3rd - 16th
Ms Ailsa Macdonald	Moss Chemist 7-9 Sycamore Walk, Blackburn	August 3rd - 16th
Ms Shireen Martin	Linton Pharmacy 1 Bridge Street, East Linton	September 21st - October 4th
Ms Elaine Craig	Hills-Lloyd Chemist Comely Bank, Edinburgh	October 5th – October 18th
Ms Rhona McWhir	Boots the Chemist 26-60 George Street, Bathgate	August 31st - September 13th
Mr Ishtiaq Mohammed	Hills-Lloyd Chemist 62/9 Gyle Loan, Edinburgh	August 3rd - 16th
Ms Jean Flett	Lindsay & Gilmour 65 Dalry Road, Edinburgh	July 20th - August 2nd
Ms Fiona Ross	Hills-Lloyd Chemist 34 John Street, Penicuik	June 29th - July 12th
Ms Fay Spooner	Spooner's Chemist 26 Main Street, Balerno	July 6th - 19th
Varied (Locums)	Hills-Lloyd Chemist High Street, Bathgate	July 20th - August 2nd

MEDICINES FROM THE DOCTOR OR THE PHARMACIST? AN ASSESSMENT OF THE COSTS AND BENEFITS

Edinburgh University is carrying out a study to find out the costs and benefits to people of getting certain medicines which can be got either from your GP on prescription, or which you can buy from the pharmacist over-the-counter.

WHY YOU?

We are approaching people collecting certain medicines within pharmacies, to ask them for more detailed information about their method of obtaining those medicines.

WHAT'S INVOLVED?

The researcher will ask you some questions about how you got your medicine. The idea is to find out the costs and benefits to you of obtaining the medicine. This should only take 5 to 10 minutes of your time. Anything you say will be completely confidential, and only seen by researchers. The information you give will not be shared with your GP or the pharmacist you visited to collect the medicine. With your permission, the researcher would contact you again, by telephone, to find out if you used general practice or pharmacy services in the couple of weeks after collection of your medicine today.

Your opinions are very valuable. The results of the study will be very useful in determining the costs and benefits to people using medicines and should help to guide new policy on medicines.

MORE INFORMATION

If you would like to know anything more about the study, or taking part, please contact Susan Myles on 0131-650-2682 or write to us at:

Department of General Practice
University of Edinburgh
20 West Richmond Street
Edinburgh
EH8 9DX

Thank you very much for your help

SM/Pharm/July98

MEDICINES FROM THE DOCTOR OR THE PHARMACIST? AN ASSESSMENT OF THE COSTS AND BENEFITS

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MORE INFORMATION

If you would like to know anything more about the study, or taking part, please contact Susan Myles on 0131-650-2682 or write to us at:

Department of General Practice
University of Edinburgh
20 West Richmond Street
Edinburgh
EH8 9DX

Thank you very much for your help

Department of General Practice
Primary Care Research Group

Medicines From the Doctor or the Pharmacist?

Case number: **Code:** 1560

Pharmacy Name: **Code:** _____

Chain or Independent: **Code:** _____

Name of Interviewer: **Code:** _____

Date of Interview: **Code:** _____

Day of Interview: **Code:** _____

Time of Interview: **Code:** _____

Section A: P Medicine obtained and how?

I'd like to begin by asking you a couple of questions about the medicine which you collected today.

A1. Name of P medicine(s) collected?:

Code	P medicine collected	Amount	Dosage
	1		
	2		
	3		
	4		

Note: where more than one P medicine obtained, write down the names, amount and dosage of them all

If respondent can't answer - ask, 'do you mind if I just get that information from the pharmacist at the end?'

A2. Is the medicine you are collecting today for you?

Circle only one

Yes, for me	No, for someone else
1	2
If yes go to A4	If no go to A3

A3. Who is the medicine(s) for?

Circle only one

Wife/ husband/ partner	Child	Parent	Grandchild	Other family member	Non-relative	Other (specify)	Don't know
1	2	3	4	5	6	7	8

A4. Did you (they) get the medicine that you collected today on prescription from a GP, or direct from the pharmacist?

Circle only one

Prescription from GP	Direct from pharmacist	Don't know
1	2	8
Go to B1, page3	Go to D1, page10	Discontinue interview

Section B: Medicines obtained on prescription during a recent GP appointment

The next few questions are about how you got the prescription for the medicine which you collected today.

B1. Was the prescription obtained during an appointment with a GP, or on repeat prescription?

Circle only one

GP appointment	Repeat prescription
1	2
Go to B2	Go to C1, p7

B2. How long did you (they) have to wait for an appointment to see the GP to get the prescription for the medicine you collected today?

Circle only one

Same day	Following day	2 days	3-5 days	>5 days (specify days)	Don't know
01	02	03	04		88

B3. How long did you (they) have to wait in the doctor's surgery before you (they) were seen by a GP?

Circle only one

No wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)	Don't know
01	02	03	04		88

B4. How long were you (they) in with the GP during your (their) recent appointment?

Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)	Don't know
01	02	03	04		88

B5. How did you (they) get to the GP surgery?

Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)	Don't know
1	2	3	4	5	6	8

B6. How long did it take you (them) to get there?

Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)	Don't know
01	02	03	04		88

B7. Did you (they) have to make any special arrangements to go for your (their) recent GP appointment?

Prompt - for example, time off work, childcare or any other arrangements?

Yes, made special arrangements	No, no special arrangements made	Don't know
1	2	8
Go to B8	Go to B10	Go to B10

B8. What were they?

Circle all that apply

Time off work	Child care arrangements	Other (specify)	Don't know
1	1	1	1

B9. How long did you (they) have to make those arrangements for?

Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hrs)	Don't know
01	02	03	04		88

The next few questions are about your visit to the pharmacy today

B10. Did you come straight from your (their) GP to the pharmacy just now?

Circle only one

Yes	No
1	2

B11. How did you get here?

Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)
1	2	3	4	5	6

B12. How long did it take you to get here?
Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)
01	02	03	04	

B13. How long have you waited to pick up your (their) prescription?
Circle only one

No wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)
01	02	03	04	

B14. Did you have to make any special arrangements to come to pick up your (their) prescription?
Prompt - for example, time off work, childcare or any other arrangements?
Circle only one

Yes	No
1	2
Go to B15	Go to B17

B15. What were they?
Circle all that apply

Time off work	Child care arrangements	Other (specify)
1	1	1

B16. How long did you have to make those arrangements for ?
Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hrs)
01	02	03	04	

B17. Did you (they) know that you can buy the medicine that you (they) got on prescription direct from the pharmacist, over the counter?
Circle only one

Yes	No	Don't know
1	2	8

B18. In the future, would you (they) consider buying this medicine direct from the pharmacist?

Circle only one

Yes	No	Don't know
1	2	8
Go to B19	Go to B20	Go to B19

B19. What would encourage you (them) to buy the medicine you (they) received on prescription today direct from the pharmacist?

Circle all that apply

Less expensive than on prescription	More convenient to get from pharmacy	No need to wait for a GP appointment	Don't need to see the GP	Other (specify)	Don't know
1	1	1	1	1	1

B20. What puts you (them) off buying the medicine you (they) received today on prescription direct from the pharmacist?

Circle all that apply

Too expensive from pharmacy	More convenient to get from the GP	Prefer to get the GP's opinion	Exempt from prescription charge	Don't think should have to pay	Other (specify)	Don't know
1	1	1	1	1	1	1

GO TO SECTION E, QUESTION E1, PAGE 14

Section C: Medicines obtained on repeat prescription

The next few questions are about how you (they) got the repeat prescription for the medicine which you collected today.

C1. Did you (they) visit your (their) GP surgery to pick up your (their) repeat prescription?
Circle only one

Yes	No
1	2
Go to C2	Please explain

If No - researcher need to make a judgment about which questions appropriate to ask

C2. How did you (they) get to the GP surgery ?
Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)	Don't know
1	2	3	4	5	6	8

C3. How long did it take you (them) to get there ?
Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)	Don't know
01	02	03	04		88

C4. How long did you (they) have to wait at the GP surgery when picking up your (their) repeat prescription?
Circle only one

no wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)	Don't know
01	02	03	04		88

C5. Did you (they) have to make any special arrangements to pick up your (their) repeat prescription from the GP surgery?
Prompt - for example, time off work, childcare or any other arrangements?
Circle only one

Yes	No	Don't know
1	2	8
Go to C6	Go to C8	Go to C8

C6. What were they ?
Circle all that apply

Time off work	Child care arrangements	Other (specify)	Don't know
1	1	1	1

C7. How long did you (they) have to make those arrangements for ?
Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hrs)	Don't know
01	02	03	04		88

The next few questions are about your visit to the pharmacy today

C8. Did you come straight from your (their) GP to the pharmacy just now?
Circle only one

Yes	No
1	2

C9. How did you get to the pharmacy ?
Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)	Don't know
1	2	3	4	5	6	8

C10. How long did it take you to get here ?
Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)
01	02	03	04	

C11. How long have you had to wait to pick up your (their) repeat prescription?
Circle only one

No wait	0-15 mins	6-10 mins	11-15 mins	>15 mins (specify mins)
01	02	03	04	

C12. Did you have to make any special arrangements to come to the pharmacy to pick up your (their) repeat prescription today?
Prompt - for example, time off work, childcare or any other arrangements?
Circle only one

Yes	No
1	2
Go to C13	Go to C15

C13. What were they ?

Circle all that apply

Time off work	Child care arrangements	Other (specify)
1	1	1

C14. How long did you have to make those arrangements for ?

Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hrs)
01	02	03	04	

C15. Did you (they) know that you can buy the medicine that you (they) got on repeat prescription today direct from the pharmacist over the counter?

Circle only one

Yes	No	Don't know
1	2	8

C16. In the future, would you (they) consider buying this medicine direct from the pharmacist?

Circle only one

Yes	No	Don't know
1	2	8
Go to C17	Go to C18	Go to C17

C17. What would encourage you (them) to buy the medicine you (they) received on prescription direct from the pharmacist?

Circle all that apply

Less expensive than on prescription	More convenient to get from pharmacy	No need to wait for a GP appointment	Don't need to see the GP	Other (specify)	Don't know
1	1	1	1	1	1

C18. What puts you (them) off buying the medicine you (they) received on repeat prescription today direct from the pharmacist?

Circle all that apply

Too expensive from pharmacy	More convenient to get from the GP	Prefer to get the GP's opinion	Exempt from prescription charge	Don't think should have to pay	Other (specify)	Don't know
1	1	1	1	1	1	1

GO TO SECTION E, QUESTION E1, PAGE 14

Section D: Medicines obtained over the counter direct from the pharmacist

The next few questions are about this visit to the pharmacy to obtain the medicine(s) you have just bought and whether you (they) have been to your (their) GP about them.

D1. How much did your (their) medicine(s) cost you (them)?

Medicine 1	Medicine 2	Medicine 3	Medicine 4
£	£	£	£

Note: Important to get the individual cost of each P medicine bought

D2. How did you get to the pharmacy today?

Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)	Don't know
1	2	3	4	5	6	8

D3. How long did it take you to get here?

Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)
01	02	03	04	

D4. How long have you had to wait to pick up your (their) medicine?

Circle only one

No wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)
01	02	03	04	

D5. Did you have to make any special arrangements to come to the pharmacy today to buy this medicine?

Prompt - for example, time off work, childcare or any other arrangements?

Circle only one

Yes	No
1	2
Go to D6	Go to D8

D6. What were they?
Circle all that apply

Time off work	Child care arrangements	Other (specify)
1	1	1

D7. How long did you have to make those arrangements for?
Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hours)
01	02	03	04	

The next few questions are about whether you (they) have visited the GP about the symptoms for which you bought your (their) medicine today

D8. Have you (they) consulted your (their) GP this time about the symptoms you've (they've) got just now which you bought the medicine for?
Circle only one

Yes	No	Don't know
1	2	8
Go to D9	Go to D19	Go to D19

*Emphasise that we are interested in **this episode** of symptoms if respondent is unsure*

D9. When was that?
Circle only one

Today	Yesterday	In the last week	In the last fortnight	> 2 weeks ago	Other (specify)	Don't know
1	2	3	4	5	6	8

D10. How long did you (they) have to wait for your (their) appointment to see the GP?
Circle only one

Same day	Following day	2 days	3-5 days	>5 days (specify days)	Don't know
01	02	03	04		88

D11. How long did you (they) have to wait in the doctor's surgery before you (they) were seen by a GP?
Circle only one

No wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)	Don't know
01	02	03	04		88

D12. How long were you (they) in with the GP during your (their) recent appointment?
Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)	Don't know
01	02	03	04		88

D13. How did you (they) get to the GP surgery?
Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)	Don't know
1	2	3	4	5	6	8

D14. How long did it take you (them) to get there?
Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)	Don't know
01	02	03	04		88

D15. Did you (they) have to make any special arrangements to go for your (their) GP appointment?
Prompt - for example, time off work, childcare or any other arrangements?
Circle only one

Yes	No	Don't know
1	2	8
Go to D16	Go to D18	Go to D18

D16. What were they?
Circle all that apply

Time off work	Child care arrangements	Other (specify)	Don't know
1	1	1	1

D17. How long did you (they) have to make those arrangements for?
Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hrs)	Don't know
01	02	03	04		88

D18. Did the doctor write you (them) a prescription for a medicine to help with the symptoms you bought your (their) medicine for today?
Circle only one

Yes	No	Don't know
1	2	8

D19. In the future, would you (they) consider attending the GP to obtain a prescription for the medicine which you bought direct from the pharmacist today?

Circle only one

Yes	No	Don't know
1	2	8
Go to D20	Go to D21	Go to D20

D20. What would encourage you (them) to attend the doctor to obtain a prescription for the medicine you bought direct from the pharmacist today?

Circle all that apply

Less expensive on prescription	More convenient to get from the GP	Prefer to get the GP's opinion	Exempt from prescription charge	Other (specify)	Don't know
1	1	1	1	1	1

D21 What puts you (them) off going to the doctor to get a prescription for the medicine that you bought today direct from the pharmacist?

Circle all that apply

Too expensive on prescription	More convenient to get from the pharmacist	Need to wait for a GP appointment	Don't need to see the GP	Other (specify)	Don't know
1	1	1	1	1	1

D22. Why did you (they) decide to buy your (their) medicine direct from the pharmacist today, rather than getting a prescription from the GP?

Circle all that apply

Cheaper than prescription	More convenient	Other (specify)	Don't know
1	1	1	1

GO TO SECTION E, QUESTION E1, PAGE 14

Section E: Use of general practice and pharmacy services and prescription and other medicines

These next few questions are about how easy it is for you (them) to see your (their) GP and pharmacist, your (their) use of medicines and a couple of questions about your (their) general health.

E1. In the last year, how many times have you (they) consulted or spoken to your (their) GP about yourself (themselves)?

Circle only one

Not at all	Once or twice	3-5 times	6-10 times	>10 times (specify no. times)	Don't know
01	02	03	04		88

E2. How long do you (they) usually have to wait to get an appointment with your (their) GP?

Circle only one

Same day	Following day	2 days	3-5 days	>5 days (specify days)	Don't know
01	02	03	04		88

E3. How far do you (they) live from your (their) GP surgery?

Circle only one

< a mile	1-2 miles	3-4 miles	5 or more (specify miles)	Don't know
01	02	03		88

E4. In the last year, how many times have you (they) consulted or spoken to a pharmacist about yourself (themself)?

Circle only one

Not at all	Once or twice	3-5 times	6-10 times	>10 times (specify no. times)	Don't know
01	02	03	04		88

E5. Do you (they) use the same pharmacist regularly?

Circle only one

Yes	No	Don't know
1	2	8

E6. How far do you (they) live from the pharmacy you (they) use most often?
Circle only one

< a mile	1-2 miles	3-4 miles	5 or more (specify miles)	Don't know
01	02	03		88

Prompt - the next question requires only a yes or no answer

E7. Do you (they) currently get any medicines, pills, ointments, puffers or injections regularly on prescription from your (their) GP?
Circle only one

Yes	No	Don't know
1	2	8

E8. Do you (they) currently pay for your (their) prescriptions?
Circle only one

Yes	No	Don't know
1	2	8
Go to E9	Go to E10	Go to E11

E9. Do you (they) purchase a four or twelve month pre-payment certificate to pay for your (their) prescriptions?
Circle only one

Yes, 4 months	Yes, 12 months	No	Don't know
1	2	3	8
Now go to E11	Now go to E11	Now go to E11	Now go to E11

E10. Could you just tell me why you (they) are exempt from prescription charges?
Circle only one

Under 16	16-18 in FT educ	60 years or over	Maternity or medical exempt	Prepaid certificate	War/MoD pensioner	Receiving a benefit	Other (specify)	Don't know
01	02	03	04	05	06	07	08	88

E11. We are interested in the cost of medicines and prescriptions and whether it stops people getting them. Do you mind telling me whether you (they) ever don't get medicines you (they) feel you (they) need because of their cost or the cost of the prescription?

Circle only one

Yes	No	Don't know
1	2	8

E12. In general, how would you (they) describe your (their) health?

Circle only one

Very good	Good	Fair	Bad	Very bad	Don't know
1	2	3	4	5	8

Prompt - the next question requires only a yes or no answer

E13. Do you (they) have any longstanding illness, disability or infirmity? By longstanding I mean anything that has troubled you (them) over a period of time, or that is likely to affect you (them) over a period of time.

Circle only one

Yes	No	Don't know
1	2	8

GO TO SECTION F, QUESTION F1, PAGE 17

Section F: Demographic details of the respondent

In order to give me a picture of the people I've spoken to in this survey, these next few questions ask for a little more information about yourself and where you live. Again, I should stress that all the information you share with me will be treated in the strictest of confidence and will not be divulged to anyone.

F1. Sex of respondent (person the medicine for)?
Circle only one

Male	Female
1	2

Prompt - "Could I ask you to look at this card (A) and read out the number of the ethnic group you feel you belong to?"

F2. To which ethnic group do you (they) belong? *(Use Showcard A here)*
Circle only one

White	Black - Caribbean	Black - African	Black - other	Indian	Pakistani	Bangladeshi	Chinese	None of these	Don't know
01	02	03	04	05	06	07	08	09	88

F3. Do you mind telling me your date of birth?

Date of Birth	Don't know
	888888

Researcher - please circle correct age band below

Note: ask for age band if reluctant

Circle only one

<16 years	16-19	20-29	30-39	40-49	50-59	60-69	70 or over	Don't know
01	02	03	04	05	06	07	08	88

F4. What is your (their) marital status?
Circle only one

Married	Living with partner	Widowed	Divorced	Separated	Single, never married	Not applicable (child)	Don't know
1	2	3	4	5	6	7	8

Prompt - "Could I ask you to look at this card (C) and read out the number next to the group that best describes your accommodation?"

F5. Can I just ask about your (their) accommodation. Which of the following best describes your (their) accommodation? (*Use Showcard C here*)

Circle only one

If owned, is it::	With mortgage/ loan	Owned outright
	01	02

If rented, is it::	Local authority	Housing assoc	Privately, furnished	Privately, unfurnished	From employer	Other, with payment	Rent free	Don't know
	03	04	05	06	07	08	09	88

F6. What is your (their) postcode

Postcode	Don't know
	8888888

F7. Is there a car or van normally available for use by you or any members of the household?

Circle only one

Yes	No	Don't know
1	2	8

Prompt - "Could I ask you to look at this card (B) and read out the number next to the group that best describes what you're doing now?"

F8. Can I just ask about your (their) employment? Which of the following applies to you (them)? (*Use Showcard B here*)

Circle only one

Paid work FT	Paid work PT	On govt training scheme	Retired	Unem-ployed	Disabled invalid or perm sick	Caring for home & family or dependents	In FT education	Some-thing else (specify)	Don't know
01	02	03	04	05	06	07	08	09	88

F9. At what age did you (they) finish your (their) continuous full-time education at school or college?

Age	Still in FT education	Don't know
	001	888

FINALLY:

I would like to follow people up who have taken part in this interview by telephone, to ask them a few questions about their subsequent use of general practice and pharmacy services. Again, I should stress that it would be completely confidential and would only take about 5 minutes. Would you be willing to take part in a short telephone follow up interview?

Circle only one

Yes	No
1	2

Proxy responder?
Circle only one

Yes	No
1	2

If yes, name and contact telephone number

Name	Telephone No.

Is there a convenient time to contact you by telephone?

Circle all that apply

morning	afternoon	early evening	later evening
1	1	1	1

If no, any reason given?

I'll leave you with a short leaflet outlining the study and my contact telephone number in case you have any queries about taking part.

THANK YOU VERY MUCH INDEED FOR YOUR TIME AND HELP WITH THIS SURVEY

Card A

Could you please read out the number of the ethnic group to which you consider you belong?

White	1
Black – Caribbean	2
Black – African	3
Black – Other	4
Indian	5
Pakistani	6
Bangladeshi	7
Chinese	8
None of these	9

Card B

Could you please read out the number of the group below which best describes what you are doing now?

in paid work - full time	1
in paid work - part time	2
on a government training scheme	3
retired	4
unemployed	5
disabled, invalid or permanently sick	6
caring for home and family or dependants	7
in full time education	8
something else (please specify)	9

Card C

Could you please read out the number of the group below which best describes your accommodation?

owned – with a mortgage	1
owned – outright	2
rented – from the local authority	3
rented from a housing association	4
rented – privately, furnished	5
rented – privately, unfurnished	6
rented – from employer	7
other – with payment	8
rent free	9

SM/Pharm/July98

MEDICINES FROM THE DOCTOR OR THE PHARMACIST? AN ASSESSMENT OF THE COSTS AND BENEFITS

Non Responders Minimum Data Collection Form

Pharmacy Name:	**Pharmacy Code:**
Interviewer Name:	**Interviewer Code:**
Date of Interview:	**Date Code:**
Day of Interview:	**Day Code:**
Time of Interview:	**Time Code:**
	Tick correct boxes
Prescription:	
OTC:	
Male:	
Female:	
Any reason(s) given for non response?:	

Department of General Practice
Primary Care Research Group

Medicines from the Doctor or the Pharmacist?
Pharmacy Interview - Telephone Follow Up

Case No: _____

Name: _____

Proxy for: _____

Medicine: _____

OTC or Rx: _____

Preferred Calling Times: _____

Interview Completion Date: _____

Section G: Follow up visit to the GP or pharmacist?

Can I begin by asking about your use of general practice and pharmacy services since we last talked?

G1. Have you (they) visited the GP about the symptoms for which you (they) got the medicine that we talked about last time?

Prompt - for example, for another medicine or for further advice?

Circle only one

Yes	No
1	2
If yes, go to Section H, Qu. H1, Page 3	If no, go to Question G2

G2. Have you (they) visited the pharmacist about the symptoms for which you (they) got the medicine that we talked about last time?

Prompt - for example, for another medicine or for further advice?

Circle only one

Yes	No
1	2
If yes, go to Section I, Qu. I1, Page 7	If no, go to Section J, Page 9

If Yes, prompt - Can I just double check then, you went back to the pharmacy only and not to the doctor at all?

If No, prompt - Can I just double check then, you haven't needed to visit either the GP or a pharmacist for any more advice about the symptoms you were treating the last time we talked?

GO TO SECTION J, QUESTION J1, PAGE 9

Section H: Follow up visit to the GP to obtain additional medicines or advice

These next few questions are about your (their) follow up visit to the GP since the last time we spoke.

H1. Your (their) follow up visit to the GP, was that for an appointment or to pick up a prescription only?

Circle only one

Appointment	Prescription Only
1	2
Go to Question H2	Go to Question H5

H2. How long did you (they) have to wait for a follow up appointment to see the GP?

Circle only one

Same day	Following day	2 days	3-5 days	>5 days (specify days)	Don't know
01	02	03	04		88

H3. How long did you (they) have to wait in the doctor's surgery before you (they) were seen by a GP?

Circle only one

No wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)	Don't know
01	02	03	04		88

H4. How long were you (they) in with the GP during your (their) follow up appointment?

Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)	Don't know
01	02	03	04		88

H5. How did you (they) get to the GP surgery?

Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)	Don't know
1	2	3	4	5	6	8

H6. How long did it take you (them) to get there?

Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)	Don't know
01	02	03	04		88

H7. Did you (they) have to make any special arrangements to go for your (their) follow up GP appointment?

Prompt - for example, time off work, childcare or any other arrangements?

Yes, made special arrangements	No, no special arrangements made	Don't know
1	2	8
Go to H8	Go to H10	Go to H10

H8. What were they?

Circle all that apply

Time off work	Child care arrangements	Other (specify)	Don't know
1	1	1	1

H9. How long did you (they) have to make those arrangements for?

Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hrs)	Don't know
01	02	03	04		88

H10. During your (their) follow up appointment with the GP, did the doctor give you (them) a prescription for other medicine(s) or did you (they) just get advice?

Circle only one

Prescription	Advice Only
1	2

H11. Did you (they) visit a pharmacy to pick up other medicine(s) after your (their) follow up appointment with the GP?

Circle only one

Yes	No
1	2
If yes, go to H12	If no, go to Section J, Page 9

The next few questions are about your (their) visit to the pharmacy after your (their) follow up GP appointment

H12. At your (their) follow up visit to the pharmacy, did you (they) get other medicine(s) or did you (they) just get advice?

Circle only one

Medicines	Advice Only
1	2
Go to Question H13	Go to Question H16

H13. How many other medicines did you (they) get?

Circle only one

One	Two	Three	Four	Five	> Five (specify)
01	02	03	04	05	

H14. Were the medicines you (they) got on prescription, or did you (they) buy them over the counter from the pharmacist direct?

Circle only one

Prescription	OTC
1	2
If Prescription, go to H16	If OTC, go to Question H15

H15. How much did the medicine(s) that were bought over-the-counter cost you (them)?

Medicine 1	Medicine 2	Medicine 3	Medicine 4
£	£	£	£

H16. How did you (they) get to the pharmacy?

Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)
1	2	3	4	5	6

H17. How long did it take you (them) to get to the pharmacy?

Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)
01	02	03	04	

H18. How long did you (they) have to wait in the pharmacy to pick up your (their) medicine(s)?

Circle only one

No wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)
01	02	03	04	

H19. Did you (they) have to make any special arrangements to pick up the medicine(s)?

Prompt - for example, time off work, childcare or any other arrangements?

Circle only one

Yes	No
1	2
Go to H19	Go to Section J, Page 9

H20. What were they?

Circle all that apply

Time off work	Child care arrangements	Other (specify)
1	1	1

H21. How long did you (they) have to make those arrangements for ?

Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hrs)
01	02	03	04	

GO TO SECTION J, QUESTION J1, PAGE 9

Section I: Follow up visit to the pharmacy to obtain additional over-the-counter medicines or advice

The next few questions are about your (their) follow up visit to the pharmacy.

I1. At your (their) follow up visit to the pharmacy, did you (they) have to get any other medicine(s) or did you (they) just get advice?

Circle only one

Other Medicines	Advice Only
1	2
Go to Question I2	Go to Question I4

I2. How many other medicines did you (they) get?

Circle only one

One	Two	Three	Four	Five	> Five (specify)
01	02	03	04	05	

I3. How much did the medicine(s) that you (they) bought over-the-counter cost you (them)?

Medicine 1	Medicine 2	Medicine 3	Medicine 4
£	£	£	£

I4. How did you (they) get to the pharmacy?

Circle only one

Walked	Bus	Train	Taxi	Car	Other (specify)	Don't know
1	2	3	4	5	6	8

I5. How long did it take you (them) to get to the pharmacy?

Circle only one

<5 mins	5-10 mins	11-15 mins	16-20 mins	>20 mins (specify mins)
01	02	03	04	

I6. How long did you (they) have to wait to get the additional medicine(s) or advice in the pharmacy?

Circle only one

No wait	0-5 mins	6-10 mins	11-15 mins	>15 mins (specify mins)
01	02	03	04	

I7. Did you (they) have to make any special arrangements to go to the pharmacy to get your (their) additional medicine(s) or advice?

Prompt - for example, time off work, childcare or any other arrangements?

Circle only one

Yes	No
1	2
Go to Question I8	Go to Section J, Page 9

I8. What were they?

Circle all that apply

Time off work	Child care arrangements	Other (specify)
1	1	1

I9. How long did you (they) have to make those arrangements for?

Circle only one

1-2 hours	3-4 hours	5-6 hours	7-8 hours	>8 hours (specify hours)
01	02	03	04	

GO TO SECTION J, QUESTION J1, PAGE 9

Section J: User views on availability of medicines

These last two questions ask for your (their) general views on availability of medicines and about the circumstances in which you would choose to use the GP or the pharmacist.

J1. In what circumstances would you (they) prefer to go to the pharmacist, rather than the doctor?

_____
_____
_____
_____
_____

J2. What do you (they) think about making more medicines which were in the past prescribed, available from the pharmacist to buy?

_____
_____
_____
_____
_____

That's the interview finished now. I'd just like to thank you for helping us out. We really appreciate your time. Your views will be important in informing future policy on medicines .

Thanks once again for all your help

Medicines From the Doctor or the Pharmacist?
Pharmacy Interview - Telephone Follow Up - Data Collection Form

Case Number:	
Respondent's Name:	
Respondent's Tel No:	
Proxy For:	
Medicine Name:	
Prescription or OTC:	
Pharmacy:	
Preferred Calling Times:	
Interview Completion Date:	

Section G			
Question	Response Code	Question	Response
G1		G2	

Section H		Section I	
Question	Response Code	Question	Response
H1		I1	
H2		I2	
H3		I3	
H4		I4	
H5		I5	
H6		I6	
H7		I7	
H8		I8	
H9		I9	
H10		Call Record:	
H11		Date:	Action:
H12			
H13			
H14			
H15			
H16			
H17			
H18			
H19			
H20			
H21			

Interview Notes:

Section J

J1. In what circumstances would you prefer to go to the pharmacist, rather than the GP?

J2. What do you think about making more medicines, which were in past prescribed, from the pharmacist to buy?

3 June 1998

Dear

Deregulated Medicines Research Project - Briefing Pack for Training Session on 11th June 1998, 4pm - 6pm in Department Library

I enclose a briefing pack for your training session on 11th June. I'd be grateful if you could set aside a couple of hours to familiarise yourself with the information prior to the training session, particularly the questionnaire (although all of the materials are still in draft form and may be subject to change). I have arranged for you to be paid for your reading time and for the training day (4 hours in total).

I hope that the information contained in the briefing pack is helpful. We'll have a chance to go over it all on the 11th.

Meanwhile, I'm really looking forward to meeting and working with you on the project.

Best wishes,

Yours sincerely,

Susan Myles

Department of General Practice
Primary Care Research Group

Deregulated Medicines: From the GP or Pharmacist?

1998

Briefing Pack

Deregulated Medicines Research Project

Contents of Training Session Briefing Pack

- Training session programme
- Project summary leaflet
- User information leaflet
- List of all deregulated P medicines
- Fieldwork instructions
- General notes on coding & completion of the questionnaire
- Information poster to display on the pharmacy counter
- Tips on how to get that interview!
- Questionnaire
- Questionnaire show cards
- Non responders minimum data collection form
- Overall fieldwork timetable
- Individual researchers' fieldwork timetables
- Fieldworker's essential survival kit
- Project contact details
- Travel expenses form
- Researcher time sheets

Fieldwork Materials Still to Follow:

- Identification badge and card
- Full list of deregulated P medicines
- Clip board and pens
- Wallet to hold all the materials
- Laminated pharmacy poster
- Laminated questionnaire show cards

Deregulated Medicines: From the GP or Pharmacist?

Interviewers Training Day - Programme
Thursday June 11th 1998

1. Background and introduction to the project

2. The questionnaire - aims & administration

3. Interview training – role play

4. Administration - contacts, time sheets, expenses

5. Confirmation of training and fieldwork dates

6. Discussion & questions

Fieldwork Instructions

1. Background and purpose of the study

The "Deregulated Medicines: From the GP or the Pharmacist?" study is being funded over three years by an MRC (Medical Research Council) Special Training Fellowship in Health Services research, held by Susan Myles and supervised by Dr Sally Wyke, both from the Department of General Practice, Primary Care Research Group, University of Edinburgh.

The aim of the study is principally to *assess the extent to which deregulation of prescription only medicines (POMs) to pharmacy available status (Ps) results in substitution or complementary usage between general practice and community pharmacy services, investigating the direct and indirect costs and benefits accruing to users, community pharmacists and general practitioners as a result.*

The key objective of the first stage of data collection, via the short interviews with users collecting deregulated (P) medicines within pharmacies, is to describe the consultation career paths adopted by users to access deregulated (P) medicines. For example a number of possible consultation career paths for accessing deregulated (P) medicines exist. For example,

(**1**) User consults their GP and obtains a prescription for a deregulated (P) medicine which they pick up from a pharmacy

(**2**) User does not consult their GP this time but picks up a repeat prescription for a deregulated (P) medicine from their GP surgery which they then pick up from a pharmacy

(**3**) User obtains a prescription either during a GP appointment or on repeat prescription and then visits the pharmacy. However, instead of collecting their prescription medicine, they opt rather to buy a similar or equivalent deregulated (P) medicine involving a supervised sale by a pharmacist. This route is most likely to be pursued when the deregulated (P) medicine prescribed by the GP is available over-the-counter from the pharmacist at a cheaper cost than paying the flat £5.80 prescription charge fee.

(**4**) User goes direct to the pharmacist and purchases a deregulated (P) medicine, over-the-counter during a supervised sale. The user has not consulted their GP to obtain a prescription or collect a repeat prescription for this medicine this time

The short pharmacy questionnaire aims to establish exactly what route the user took to access the deregulated (P) medicine they are picking up and will allow us to assess the extent of substitution or complementary usage between general practice and pharmacy services by users when obtaining deregulated (P) medicines.

Definitions of Different Classes of Medicines

1. Prescription Only Medicines (POMs)
Prescription Only Medicines (POMs) are those medicinal products supplied in accordance with a prescription given by an appropriate practitioner e.g. registered doctors, dentists and nurse prescribers. They are medicines which can only be obtained with a prescription.

2. Pharmacy Medicines (Ps)
Pharmacy medicines (Ps) are not available for general sale. The sale of P medicines must be supervised by a pharmacist. A prescription may be presented for P class medicines.

3. General Sales List Medicines (GSL)
Are medicinal products that are available for general sale which do not require a prescription or the supervision of a pharmacist at the point-of-sale.

For this study we are interested specifically in deregulated (P) pharmacy available medicines. Two main options exist for users trying to get these medicines: (i) they can visit their GP who can write them a prescription for a pharmacy available P medicine; or (ii) they can buy them direct from a pharmacist, involving a supervised sale.

For a full list of all deregulated pharmacy available (P) medicines, see sheet entitled, "Full List of All Deregulated Pharmacy Available (P) Medicines".

2. Introducing the study

Be friendly and polite. Emphasise that it only takes 5 minutes and that all information given is strictly confidential, seen only by researchers and will not affect the treatment they receive or be shared with the pharmacist of the persons GP.

Keep the introduction as brief as is consistent with securing agreement.

See "Specimen Study/Interview Introductions" sheet. While it is important to cover the key points made in these, it will be easier if you customise them into language that you would use and feel comfortable with.

3. Common questions and answers

(a) What is the purpose of the survey?

Its main aim is to get a picture of how people get certain medicines and to understand the services they use to do so.

It will also help us to understand how much it costs different groups of people to get medicines.

It will be used to produce helpful information that may be used to inform future health care policy e.g. on decisions about how best to set up services to make medicines readily available to different groups in the population.

(b) Who is it for?

The research project is being funded by the Medical Research Council and is being conducted for them by Edinburgh University Medical School

All the information that you share with me will be treated in the strictest of confidence and will not be seen or given to anyone else except researchers at Edinburgh University. The information will not be shared with your doctor or the pharmacist and will not affect the treatment you receive.

(c) What does it involve?

It involves a very short 5 minute questionnaire about how you got your medicine today, how easy it is for you to see the doctor and the pharmacist, a couple of questions about your general health and some general questions about you, to give us a picture of all the people we've spoken to in our survey.

With your permission, I would also like to follow you up by telephone in the next week to ten days. This will involve a five minutes conversation, the aim of which is to find out whether you visited either a GP or a pharmacist after collecting the medicine that you got today. This would be arranged at a convenient time for you and would again be strictly confidential.

(d) How/why was I selected?

We asked 14 pharmacies across Lothian to take part in the study. We are visiting each of these fourteen pharmacies for two weeks. During this time, we are asking everyone buying or collecting a prescription for certain medicines to take part in our survey, by answering a short 5 minutes questionnaire.

We want to collect information from all different kinds of people so that the results of our survey reflect the Lothian area as a whole. We're hoping to speak to 1500 people in total. So, we'd really appreciate it if you would agree to take part.

(e) What about confidentiality?

Complete confidentiality is guaranteed. Your name would not be held with the answers you gave to our questions and it would be impossible to identify you personally. The information you give us will not be shared with any one else, including your doctor or the pharmacist. It will only be seen by researchers from the University of Edinburgh Medical School. You don't even have to give your name if you would prefer to remain anonymous.

(f) I may not know the answer to your questions

The questions are straightforward and not intended to be difficult or tricky. If there are any questions that you are unsure about, that is fine, or if there are any that you would prefer not to answer then that too is okay.

(g) The medicine is not for me

That's okay. I'd still like the opportunity to ask the questions on behalf of the person that you are collecting the medicine for. If there are a few questions that you are unsure about, that's fine. It'd be really helpful to us if you could still take part.

(h) Why should I bother taking part?

We're hoping to talk to as many and as broad a selection of people within Lothian as possible. Information is needed about all the different sections of the population; people who consult their GP to get medicines on prescription, people who visit the pharmacy to get medicines, single people, married people, retired people, disabled people and those in work and not in work, and so on. Your views and circumstances are important. By taking part, you and other people in similar circumstances have an opportunity to be represented within our research.

The results of this study may be used to inform future health care policy.

Specimen Study/Interview Introductions

Below are noted a couple of potential introductions that you could use to give the user some information about the study and hopefully entice them to want to take part. It's probably best to keep your introduction both simple and brief, to avoid scaring off potential respondents. Also, as noted before, while you should try to include the key points as outlined below, it is probably better if you have a bash at putting them into your own words, that you would feel comfortable using.

My name is Susan Myles. I am a researcher with Edinburgh University Medical School. (Show identification card) We are undertaking a research project looking into the way in which people get hold of medicines that can be got, either from the general practitioner on prescription, or purchased over-the-counter direct from the pharmacist. I'd like to ask you a few questions about the medicine(s) you got at the pharmacy today and about your use of general practice and pharmacy services. It should only take about five minutes of your time. All the information you share with me is will be completely confidential and can also be anonymous if you wish. This information cannot be linked back to you personally and will not be shared with either your GP or the pharmacist. Have you got five minutes just now?

Hi, my name is Susan Myles, I am a researcher with Edinburgh University Medical School. (Show identification card). We are doing a study about how people access certain medicines that used to only be available on prescription, but which can now be got from the pharmacist direct, over-the-counter. You picked up one of these medicines today. Would you mind if I asked you a few questions about it? It should only take about 5 minutes of your time. All the information you share with me would be completely confidential and will be seen only by researchers. Have you got five minutes just now?

We would like to find out what extra money and time you had to spend to obtain your medicine. Your answers are important because they will give those who make decisions about patient treatment within the National Health Service and idea of how much it costs you to use health services (UK Working Party on Patients' Costs, 1999).

Note if user unsure about participation, offer them a leaflet to read that explains the study.

General Notes on Coding and Completion of the Questionnaire

Front Cover Coding/Completion:

Case number:

This will be a **four** digit number, already on the questionnaire after final printing e.g. 0001, 0002, etc.

Pharmacy Name:

Write in the pharmacy name and enter its code number as below:

Pharmacy Name	Pharmacy Code Number
Broughton Street	**1**
Livingston	**2**
Penicuik	**3**
Balerno	**4**
Bathgate	**5**
Dalry Road	**6**
Blackburn	**7**
Gyle Loan	**8**
Dalkeith	**9**
North Berwick	**10**
Bathgate	**11**
Niddrie Mains	**12**
East Linton	**13**
Fauldhouse	**14**
Comely Bank	**15**

Name of Interviewer:

Write in your name and interviewer code as below:

Interviewer Name	Interviewer Code Number
Susan Myles	**1**
Carrie Paxton	**2**
Vera Higgins	**3**
Sarah Huby	**4**

Date of Interview:

Write in date and code with **6 digits** as follows e.g. 1st June 1998 = 010698

Day of Interview:

Write in the day and code as follows:

Day	Code for Day
Monday	**1**
Tuesday	**2**
Wednesday	**3**
Thursday	**4**
Friday	**5**
Saturday	**6**
Sunday	**7**

Time of Interview:

Write in the time of interview and code using 4 digits and **24 hour clock** e.g. 4.10 p.m. = 1610

General Points on Questionnaire Completion

- Clearly circle the code numbers and make sure that you have circled one for every question
- Where see 'Other (specify)' take care to fill these in (although the limit is usually 10 characters)
- 'Don't know' is always coded as number 8
- Where any extra (interesting/potentially useful) information is given by the respondent, write it down for me to have a look at later
- If unsure which code to circle write down the respondent's answer (try to avoid this where possible though)
- Try to write clearly and legibly
- Remember to ask all respondents at the end of the questionnaire if they would be happy to be followed up?
- At end of questionnaire remember to always offer respondents an information leaflet

Get that Interview!

1. Introduce yourself and show your authorisation card

2. Introduce the project

3. Explain why this person approached

4. Don't say too much

5. Be positive. Believe in yourself and the survey. Act as if you have never had a refusal

6. Build rapport. Smile. Look and listen. Relate to your respondent but don't be so chummy that they think that you are being insincere

Fieldworker's Essential Survival Kit

1. Sufficient questionnaires (probably 15 max. a day - let's hope for a rush)!

2. Prompt cards

3. Non-respondent minimum data collection forms

4. Identification card and badge

5. Clip board and couple of pens

6. Supply of user information leaflets

7. Pharmacy information poster (first day)

8. Pharmacist/pharmacy assistant's information packs (first day)

9. Something to read, eat and drink

10. A good sense of humour and a smile

Coding frames for user responses to open questions J1 and J2 in the telephone follow-up interview

Question J1:

"In what circumstances would you prefer to go to the pharmacist, rather than the GP?"

Broadly Positive Responses	**Code No.**
For minor things/not too serious	**1**
Convenience	**2**
Cheaper OTC	**3**
Prefer/try to use the pharmacist when I can	**4**
Good for specific groups of users	**5**
Good relationship with the pharmacist	**6**
Pharmacist highly trained/give good advice	**7**
Try to use the pharmacist first	**8**
When want a quick solution/relief	**9**
When I feel confident self treating or know what's wrong or what to do	**10**
I like to help myself whenever possible/trial & error/know own body	**11**
Relieves pressure on the doctors/NHS/saves Drs time/NHS resources	**12**
Don't need to see or have a doctor diagnose	**13**
When I'm familiar with the medicine/know what it does	**14**
Frees up time with Dr for more needy/ill	**15**
Broadly Negative Responses	**Code No.**
Difficult to get an appointment/no need to wait for appointment with GP	**16**
Don't like to bother the doctor/waste their time	**17**
Too expensive/cost prohibitive/cost a concern	**18**
Reluctant/don't like to go to the doctor	**19**
Shouldn't mix medicines/Rx and OTC drugs	**20**
Pharmacists not expert enough	**21**
I would never go to the pharmacy to buy a medicine	**22**
Better/safer/prefer to see the doctor/get a repeat Rx	**23**
No, wouldn't, as get free prescription	**24**
What Dr prescribed doesn't work	**25**
Equivocal Responses	**Code No.**
Reluctant to use either the GP or the pharmacist	**31**
Don't like to use medicines at all	**32**
With monitoring and advice	**33**
Don't know	**88**

Question J2:

" What do you think about making more medicines, which were in the past prescribed, available from the pharmacist to buy"

Broadly Positive Responses	Code No.
More convenient	1
Cheaper OTC	2
Relieves pressure on doctors/NHS/users/saves Drs time	3
Encourages more self management of minor illness	4
Provides information and education on medicines	5
Allows autonomy/choice in decision making/promotes self help	6
Pharmacist expert in medicines/highly trained/give good advice	7
Saves bothering the doctor/wasting their time	8
Frees up time with doctors for more needy/ill	9
For minor, routine things/recurrent or chronic	10
No need to wait to see the doctor/saves or no need having to see Dr	11
When confident/like to self treat/know what's wrong/what I need	12
Broadly Negative Responses	**Code No.**
Too expensive/cost prohibitive/cost concern	16
Side effects/wary of mixing medicines	17
Danger of strong medicines/safety concerns/addiction/immunity	18
Pharmacist not expert enough/not enough time or advice given	19
Prefer/better to see/left in control of the GPs	20
Potential abuses could arise/exist	21
Inappropriate or unnecessary use or overuse of medicines	22
Danger may suppress more serious/other symptoms	23
Certain groups of people really should see their GP	24
Adequacy of self diagnosis/should see a professional/proper consult.	25
Too many/enough medicines already available	26
Users have inadequate information to self diagnose and prescribe	27
Medicine not available from the GP	28
Just a way for ph and drug cos. to make money	29
Equivocal Responses	**Code No.**
With monitoring and advice from the ph	31
If demonstrated safe/min side effects/used cautionary/non addictive	32
Only for some conditions/medicines	33
Enough medicines already available	34
With doctor's sanction/advice first/had before	35
Increases pressure on pharmacists	36
Don't know	88

Appendix 3:

Chapter 3 - Results

Table A3.1: When would users prefer to use a community pharmacist?

In what circumstances would you prefer to go to the pharmacist, rather then the GP?						
User Responses	**1st N (%)**	**2nd N (%)**	**3rd N (%)**	**4th N (%)**	**5th N (%)**	*TOTAL N (%)*
Try to use the pharmacist when I can	160 (14)	48 (4)	24 (2)	8 (1)	0 (-)	240 (33)
For minor complaints	173 (15)	29 (2)	8 (1)	1 (-)	0 (-)	211 (29)
When feel confident self-treating or know what is wrong	90 (8)	37 (3)	11 (1)	4 (-)	0 (-)	142 (20)
Better/safer/prefer to see the doctor	66 (6)	26 (2)	3 (-)	0 (-)	0 (-)	95 (13)
Don't like to bother the doctor/waste their time	6 (1)	35 (3)	22 (2)	0 (-)	2 (-)	65 (9)
Pharmacist highly trained/give good advice	10 (1)	28 (2)	11 (1)	9 (1)	3 (-)	61 (8)
Convenience	21 (2)	17 (1)	9 (1)	2 (-)	1 (-)	50 (7)
When I am familiar with the medicine and know what it does	13 (1)	24 (2)	7 (-)	2 (-)	0 (-)	46 (6)
Don't like to go to the doctor	10 (1)	20 (2)	13 (1)	3 (-)	0 (-)	46 (6)
Difficult to get an apptmt./ no need to wait for an apptmt. with the GP	0 (-)	30 (3)	10 (1)	5 (-)	0 (-)	45 (6)
Like to help myself wherever possible	14 (1)	19 (2)	6 (1)	2 (-)	0 (-)	41 (6)
Cheaper OTC	11 (1)	12 (1)	9 (1)	4 (-)	0 (-)	36 (5)
Good for specific groups of users	8 (1)	9 (1)	10 (1)	2 (-)	0 (-)	29 (4)
I wouldn't go as I get my prescriptions free	19 (2)	6 (1)	2 (-)	1 (-)	0 (-)	28 (4)
Don't need to see a doctor/have a doctor diagnose	4 (-)	19 (2)	1 (-)	0 (-)	1 (-)	25 (3)
I would never go to the pharmacist to buy a medicine	20 (2)	2 (-)	0 (-)	0 (-)	0 (-)	22 (3)
Shouldn't mix medicines/prescription and OTC drugs	4 (-)	14 (1)	1 (-)	2 (-)	0 (-)	21 (3)
When want quick solution/relief	7 (1)	8 (1)	3 (-)	0 (-)	1 (-)	18 (3)
Too expensive/cost a concern	6 (1)	8 (1)	2 (-)	0 (-)	0 (-)	16 (2)
Frees up doctors time for more needy or ill/Pharmacist not expert enough	11 (1)	0 (-)	2 (-)	0 (-)	0 (-)	13 (2)

Relieves pressure on doctors & NHS/saves doctor time and resources	0 (-)	9 (1)	2 (-)	0 (-)	0 (-)	11 (2)
Good relationship with/trust the pharmacist	2 (-)	2 (-)	4 (-)	0 (-)	0 (-)	8 (1)
Don't like to use medicines at all	4 (-)	1 (-)	0 (-)	0 (-)	0 (-)	5 (1)
What doctor prescribes/ what available from pharmacist didn't work	1 (-)	3 (-)	0 (-)	0 (-)	0 (-)	4 (1)
Reluctant to use either the GP or the pharmacist	2 (-)	1 (-)	0 (-)	0 (-)	0 (-)	3 (-)
Don't know	1 (-)	0 (-)	1 (-)	0 (-)	0 (-)	2 (-)
With monitoring or advice	1 (-)	0 (-)	0 (-)	0 (-)	0 (-)	1 (-)
Pharmacist not expert enough	0 (-)	0 (-)	1 (-)	0 (-)	0 (-)	1 (-)

Table A3.1: User views on making more medicines available from community pharmacies

What do you think about making more medicines, which were in the past prescribed, available from the pharmacist to buy?						
User Responses	**1st N (%)**	**2nd N (%)**	**3rd N (%)**	**4th N (%)**	**5th N (%)**	*TOTAL* N (%)
More convenient	168 (14)	38 (3)	19 (2)	4 (-)	2 (-)	231 (32)
No need to wait to see the doctor/saves having to see the doctor	43 (4)	66 (6)	18 (2)	3 (-)	2 (-)	132 (18)
Cheaper OTC	56 (5)	25 (2)	7 (1)	2 (-)	1 (-)	91 (13)
With monitoring and advice from the pharmacist	30 (3)	33 (3)	16 (1)	4 (-)	2 (-)	85 (12)
Inappropriate or unnecessary or overuse of medicines	36 (3)	36 (3)	9 (1)	0 (-)	2 (-)	83 (12)
Relieves pressure on doctors/NHS/saves doctors time	29 (2)	24 (2)	13 (1)	4 (-)	1 (-)	71 (10)
Danger of strong medicines/safety concerns/addiction issues/immunity	34 (3)	20 (2)	9 (1)	1 (-)	1 (-)	65 (9)
Better left in the control of the GP	25 (2)	21 (2)	11 (1)	2 (-)	2 (-)	61 (8)
Potential abuses could arise	26 (2)	22 (2)	9 (1)	2 (-)	2 (-)	61 (8)
Pharmacists experts in medicines/highly trained/good advice	20 (2)	22 (2)	10 (1)	3 (-)	0 (-)	55 (8)
If demonstrated to be safe	26 (2)	14 (1)	5 (-)	1 (-)	0 (-)	46 (6)
Saves bothering the doctor/wasting their time	10 (1)	23 (2)	5 (-)	2 (-)	0 (-)	40 (6)
Too expensive/cost a concern	18 (2)	17 (1)	5 (-)	0 (-)	0 (-)	40 (6)
Adequacy of self-diagnosis/should see a professional	18 (2)	13 (1)	2 (-)	1 (-)	0 (-)	34 (5)
For minor routine things/ recurrent or chronic conditions	21 (2)	8 (1)	1 (-)	0 (-)	1 (-)	31 (4)
When confident/like to self-treat	13 (1)	12 (1)	4 (-)	0 (-)	0 (-)	29 (4)
Encourages more self-management of minor illness	12 (1)	6 (1)	5 (-)	2 (-)	0 (-)	25 (4)
With doctors sanction or advice first/if have had the medicine before	10 (1)	6 (1)	2 (-)	4 (-)	0 (-)	22 (3)
Allows autonomy/choice in decision	6 (1)	11 (1)	2 (-)	0 (-)	2 (-)	21 (3)
Concerned about side effects/wary of mixing medicines	5 (-)	10 (1)	3 (-)	2 (-)	1 (-)	21 (3)

Only for some conditions or medicines	12 (1)	6 (1)	3 (-)	0 (-)	0 (-)	21 (3)
Enough medicines available already	9 (1)	7 (1)	2 (-)	2 (-)	0 (-)	20 (3)
Don't know	12 (1)	0 (-)	0 (-)	0 (-)	0 (-)	12 (2)
Pharmacist not expert enough/not enough time or advice given	3 (-)	4 (-)	5 (-)	0 (-)	0 (-)	12 (2)
Certain groups of people really should see their GP	8 (1)	0 (-)	2 (-)	1 (-)	0 (-)	11 (2)
Just a way for pharmacists and drug companies to make money	1 (-)	5 (-)	4 (-)	0 (-)	0 (-)	10 (1)
Danger may suppress more serious or other symptoms	3 (-)	3 (-)	1 (-)	1 (-)	0 (-)	8 (1)
Too many medicines already available	3 (-)	2 (-)	0 (-)	2 (-)	0 (-)	7 (1)
Frees up more time with doctors for more needy/ill	1 (-)	4 (-)	2 (-)	0 (-)	0 (-)	7 (1)
Provides information and education on medicines	2 (-)	3 (-)	1 (-)	0 (-)	0 (-)	6 (1)
Increases pressure on pharmacists	1 (-)	1 (-)	2 (-)	1 (-)	0 (-)	5 (1)
When embarrassed and don't want to talk to the doctor about the problem	1 (-)	3 (-)	0 (-)	0 (-)	0 (-)	4 (1)
Users have inadequate information to self-diagnose and prescribe	1 (-)	1 (-)	0 (-)	0 (-)	0 (-)	2 (-)

Appendix 4:

Chapter 4 - Results

REGRESSION OUTPUT

Output Created		02 Jun 00 17:40:11
Comments		
Input	Data	D:\spss\c&botcrx\mergdata\phall03 3.sav
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	1185
Syntax		LOGISTIC REGRESSION VAR=drph1st /METHOD=FSTEP(LR) phcode chainind e1yrnogp e2uswtgp e3fargp e4yrnoph e5sameph e6farph e7regrx e8payrx e11ctoff e12genht e13lgill f1sex f3age f7carvan f9fted g6pomtop g7blackl f2summ f5summ f6summ f8summ f4mstat2 e7regrx*f5summ e5sameph*e8payrx e5sameph*g6pomtop prelrx /CONTRAST (phcode)=Deviation(1) /CONTRAST (chainind)=Deviation /CONTRAST (e5sameph)=Deviation /CONTRAST (e7regrx)=Deviation /CONTRAST (e8payrx)=Deviation /CONTRAST (e11ctoff)=Deviation /CONTRAST (e13lgill)=Deviation /CONTRAST (f1sex)=Deviation /CONTRAST (f7carvan)=Deviation /CONTRAST (f9fted)=Deviation /CONTRAST (g6pomtop)=Deviation /CONTRAST (g7blackl)=Deviation /CONTRAST (f2summ)=Deviation /CONTRAST (f5summ)=Deviation /CONTRAST (f6summ)=Deviation(1) /CONTRAST (f8summ)=Deviation(1) /CONTRAST (f4mstat2)=Deviation(1) /CONTRAST (prelrx)=Deviation /CLASSPLOT /CASEWISE OUTLIER(2) /PRINT=GOODFIT SUMMARY
Resources	Elapsed Time	0:01:20.69

Number of unselected cases: 0

Number of selected cases: 1185
Number rejected because of missing data: 111
Number of cases included in the analysis: 1074

dent Variable Encoding:

nal	Internal Value
.00	0
.00	1

	Value	Freq	Parameter Coding (1)	(2)
E				
ghton St	1	103	-1.000	-1.000
ngston	2	109	1.000	.000
cuik	3	30	.000	1.000
rno	4	102	.000	.000
e Lloyds	5	71	.000	.000
y Rd	6	24	.000	.000
kburn	7	108	.000	.000
ohns	8	91	.000	.000
eith	9	43	.000	.000
rwick	10	57	.000	.000
e Boots	11	151	.000	.000
rie Mains	12	34	.000	.000
nton	13	41	.000	.000
dhouse	14	16	.000	.000
ly Bank	15	94	.000	.000

		(3)	(4)	(5)
E				
ghton St	1	-1.000	-1.000	-1.000
ngston	2	.000	.000	.000
cuik	3	.000	.000	.000
rno	4	1.000	.000	.000
e Lloyds	5	.000	1.000	.000
y Rd	6	.000	.000	1.000
kburn	7	.000	.000	.000
ohns	8	.000	.000	.000
eith	9	.000	.000	.000
rwick	10	.000	.000	.000
e Boots	11	.000	.000	.000
rie Mains	12	.000	.000	.000
nton	13	.000	.000	.000
dhouse	14	.000	.000	.000
ly Bank	15	.000	.000	.000

		(6)	(7)	(8)
E				
ghton St	1	-1.000	-1.000	-1.000
ngston	2	.000	.000	.000
cuik	3	.000	.000	.000
rno	4	.000	.000	.000
e Lloyds	5	.000	.000	.000
y Rd	6	.000	.000	.000
kburn	7	1.000	.000	.000
ohns	8	.000	1.000	.000
eith	9	.000	.000	1.000
rwick	10	.000	.000	.000
e Boots	11	.000	.000	.000
rie Mains	12	.000	.000	.000
nton	13	.000	.000	.000
dhouse	14	.000	.000	.000
ly Bank	15	.000	.000	.000

		(9)	(10)	(11)
E				
ghton St	1	-1.000	-1.000	-1.000
ngston	2	.000	.000	.000
cuik	3	.000	.000	.000
rno	4	.000	.000	.000

ohns	8	.000	.000	.000
eith	9	.000	.000	.000
rwick	10	1.000	.000	.000
e Boots	11	.000	1.000	.000
rie Mains	12	.000	.000	1.000
nton	13	.000	.000	.000
dhouse	14	.000	.000	.000
ly Bank	15	.000	.000	.000

		(12)	(13)	(14)
E				
ghton St	1	-1.000	-1.000	-1.000
ngston	2	.000	.000	.000
cuik	3	.000	.000	.000
rno	4	.000	.000	.000
e Lloyds	5	.000	.000	.000
y Rd	6	.000	.000	.000
kburn	7	.000	.000	.000
ohns	8	.000	.000	.000
eith	9	.000	.000	.000
rwick	10	.000	.000	.000
e Boots	11	.000	.000	.000
rie Mains	12	.000	.000	.000
nton	13	1.000	.000	.000
dhouse	14	.000	1.000	.000
ly Bank	15	.000	.000	1.000

	Value	Freq	Parameter Coding (1)	(2)
AT2				
ied/live togeth.	1.00	566	-1.000	-1.000
wed	2.00	107	1.000	.000
rced/sep.	3.00	87	.000	1.000
le, never married	4.00	187	.000	.000
child	5.00	127	.000	.000

		(3)	(4)
AT2			
ied/live togeth.	1.00	-1.000	-1.000
wed	2.00	.000	.000
rced/sep.	3.00	.000	.000
le, never married	4.00	1.000	.000
child	5.00	.000	1.000

	Value	Freq	Parameter Coding (1)	(2)
M				
aid work	1.00	440	-1.000	-1.000
in paid work	2.00	150	1.000	.000
red	3.00	306	.000	1.000
educ.	4.00	104	.000	.000
thing else	5.00	74	.000	.000

		(3)	(4)
M			
aid work	1.00	-1.000	-1.000
in paid work	2.00	.000	.000
red	3.00	.000	.000
educ.	4.00	1.000	.000
thing else	5.00	.000	1.000

	Value	Freq	Parameter Coding (1)	(2)
M				
uent	1.00	293	-1.000	-1.000
age	2.00	591	1.000	.000
ived	3.00	190	.000	1.000
D				
l in f/t educat.	1	169	1.000	.000
years	2	731	.000	1.000
years	3	174	-1.000	-1.000
IND				
n	1	824	1.000	

	1	935	1.000
	2	139	-1.000
EGRX			
s	1	530	1.000
	2	544	-1.000
AYRX			
s	1	454	1.000
	2	620	-1.000
CTOFF			
s	1	165	1.000
	2	909	-1.000
LGILL			
s	1	395	1.000
	2	679	-1.000
EX			
le	1	403	1.000
male	2	671	-1.000
UMM			
me owner	1.00	722	1.000
nting	2.00	352	-1.000
UMM			
ite	1.00	1060	1.000
n white	2.00	14	-1.000
LACKL			
s	1	468	1.000
	2	606	-1.000
OMTOP			
	1	443	1.000
	2	631	-1.000
LRX			
ice paid less than or equal to the Rx charge	1.00	968	1.000
ice paid more than Rx charge	2.00	106	-1.000
ARVAN			
s	1	769	1.000
	2	305	-1.000

Interactions:

_1 E7REGRX(1) by F5SUMM(1)
_2 E5SAMEPH(1) by E8PAYRX(1)
_3 E5SAMEPH(1) by G6POMTOP(1)

pendent Variable.. DRPH1ST BY OF PH first ccp

ginning Block Number 0. Initial Log Likelihood Function

Log Likelihood 1219.8311

Constant is included in the model.

ginning Block Number 1. Method: Forward Stepwise (LR)

ep	Improv. Chi-Sq.	df	sig	Model Chi-Sq.	df	sig	Correct Class %	Variable
1	301.280	14	.000	301.280	14	.000	73.46	IN: PHCODE
2	122.673	1	.000	423.954	15	.000	78.40	IN: E8PAYRX
3	97.857	1	.000	521.810	16	.000	82.68	IN: G7BLACKL
4	34.057	1	.000	555.867	17	.000	82.31	IN: E7REGRX
5	15.312	1	.000	571.179	18	.000	83.24	IN: E4YRNOPH
6	12.100	1	.001	583.279	19	.000	82.77	IN: E1YRNOGP
7	10.823	1	.001	594.102	20	.000	84.17	IN: E5SAMEPH
8	8.083	2	.018	602.184	22	.000	84.08	IN: F6SUMM
9	5.303	1	.021	607.488	23	.000	84.54	IN: E5SAMEPH * E8PAYRX
10	10.123	4	.038	617.611	27	.000	85.29	IN: F4MSTAT2
11	4.483	1	.034	622.094	28	.000	85.66	IN: E13LGILL

more variables can be deleted or added.

d Block Number 1 PIN = .0500 Limits reached.

nal Equation for Block 1

timation terminated at iteration number 7 because
g Likelihood decreased by less than .01 percent.

2 Log Likelihood	597.737
oodness of Fit	782.942
ox & Snell - R^2	.440
agelkerke - R^2	.648

	Chi-Square	df	Significance
odel	622.094	27	.0000
lock	622.094	28	.0000
tep	4.483	1	.0342

-------- Hosmer and Lemeshow Goodness-of-Fit Test----------

DRPH1ST = Doctor first ccp DRPH1ST = Ph first ccp

oup	Observed	Expected	Observed	Expected	Total

2	77.000	77.812	30.000	29.188	107.000
3	50.000	48.305	57.000	58.695	107.000
4	28.000	25.296	79.000	81.704	107.000
5	11.000	11.930	96.000	95.070	107.000
6	6.000	6.324	102.000	101.676	108.000
7	3.000	2.856	104.000	104.144	107.000
8	1.000	1.303	106.000	105.697	107.000
9	.000	.499	107.000	106.501	107.000
10	.000	.095	110.000	109.905	110.000

	Chi-Square	df	Significance
odness-of-fit test	1.6592	8	.9897

assification Table for DRPH1ST
e Cut Value is .75

		Predicted		
		Doctor first ccp	Ph first ccp	Percent Correct
		D	P	
served				
Doctor first ccp	D	242	32	88.32%
Ph first ccp	P	122	678	84.75%
			Overall	85.66%

Variables in the Equation

riable	B	S.E.	Wald	df	Sig	R
CODE			58.4382	14	.0000	.1580
HCODE(1)	1.1908	.8809	1.8273	1	.1764	.0000
HCODE(2)	6.7147	8.9604	.5616	1	.4536	.0000
HCODE(3)	.4135	.8323	.2468	1	.6194	.0000
HCODE(4)	-.8067	.7369	1.1982	1	.2737	.0000
HCODE(5)	.9528	1.0858	.7700	1	.3802	.0000
HCODE(6)	-1.4672	.7592	3.7344	1	.0533	-.0377
HCODE(7)	-1.4553	.7144	4.1494	1	.0416	-.0420
HCODE(8)	.0864	.8207	.0111	1	.9161	.0000
HCODE(9)	1.0341	.8099	1.6304	1	.2016	.0000
HCODE(10)	.2881	.7259	.1575	1	.6915	.0000
HCODE(11)	-1.1347	.8244	1.8947	1	.1687	.0000
HCODE(12)	-1.5453	.8361	3.4155	1	.0646	-.0341
CODE(13)	-2.0591	.9994	4.2449	1	.0394	-.0429
CODE(14)	-1.2460	.7418	2.8210	1	.0930	-.0259
YRNOGP	-.2877	.1032	7.7663	1	.0053	-.0688
YRNOPH	.6764	.1407	23.1150	1	.0000	.1316
SAMEPH(1)	-.5707	.1978	8.3274	1	.0039	-.0720
REGRX(1)	-.4459	.1430	9.7179	1	.0018	-.0795
PAYRX(1)	.5280	.2019	6.8425	1	.0089	.0630
BLGILL(1)	-.2745	.1298	4.4749	1	.0344	-.0450
BLACKL(1)	1.0989	.1267	75.2441	1	.0000	.2450
SUMM			10.1243	2	.0063	.0709
5SUMM(1)	-.0572	.1899	.0906	1	.7634	.0000
5SUMM(2)	-.7476	.2811	7.0742	1	.0078	-.0645
MSTAT2			11.3466	4	.0229	.0524
4MSTAT2(1)	.2148	.2716	.6251	1	.4291	.0000
4MSTAT2(2)	-.4281	.3381	1.6035	1	.2054	.0000
4MSTAT2(3)	.5277	.2343	5.0742	1	.0243	.0502
4MSTAT2(4)	-.6626	.2972	4.9691	1	.0258	-.0493
T_2	.4816	.1909	6.3624	1	.0117	.0598
nstant	2.0926	.7849	7.1086	1	.0077	

riable	Exp(B)	Lower	Upper
CODE(1)	3.2899	.5852	18.4942
CODE(2)	824.4239	.0000	3.493E+10
CODE(3)	1.5120	.2959	7.7275
CODE(4)	.4463	.1053	1.8921
CODE(5)	2.5931	.3087	21.7814
CODE(6)	.2306	.0521	1.0211
CODE(7)	.2333	.0575	.9464
CODE(8)	1.0903	.2182	5.4471
CODE(9)	2.8125	.5751	13.7548
CODE(10)	1.3338	.3215	5.5329
CODE(11)	.3215	.0639	1.6177
CODE(12)	.2132	.0414	1.0980
CODE(13)	.1276	.0180	.9046
CODE(14)	.2877	.0672	1.2312
YRNOGP	.7500	.6126	.9182
YRNOPH	1.9668	1.4928	2.5913
SAMEPH(1)	.5651	.3835	.8327
REGRX(1)	.6403	.4837	.8474
PAYRX(1)	1.6956	1.1416	2.5186
BLGILL(1)	.7599	.5893	.9800
BLACKL(1)	3.0010	2.3411	3.8468
SUMM(1)	.9444	.6509	1.3703
SUMM(2)	.4735	.2729	.8214
MSTAT2(1)	1.2396	.7279	2.1110
MSTAT2(2)	.6517	.3360	1.2643
MSTAT2(3)	1.6950	1.0710	2.6827
MSTAT2(4)	.5155	.2879	.9231
T_2	1.6187	1.1134	2.3534

TABLE A4.1: VARIABLES NOT INCLUDED IN THE FINAL LOGISTIC REGRESSION EQUATION

Variable	Score	d.f.	Sig.	R
Chainind	0.07	1	0.78	.000
E2uswtgp	0.99	1	0.31	.000
E3fargp	1.01	1	0.31	.000
E6farph	2.27	1	0.13	.015
E11ctoff	0.70	1	0.40	.000
E12genht	1.36	1	0.24	.000
F1sex	0.06	1	0.79	.000
F3age	0.50	1	0.47	.000
F7carvan	1.63	1	0.20	.000
F9fted	0.07	1	0.77	.000
G6pomtop	0.17	1	0.67	.000
F2summ	0.28	1	0.59	.000
F5summ	0.56	1	0.45	.000
F8summ	2.50	4	0.64	.000
F8summ(1)	1.04	1	0.30	.000
F8summ(2)	0.16	1	0.68	.000
F8summ(3)	1.03	1	0.31	.000
F8summ(4)	0.95	1	0.32	.000
E7regrx(1) by F5summ	1.46	1	0.22	.000
E5sameph(1) by G6pomtop (1)	1.05	1	0.30	.000
Prelrx	1.39	1	0.23	.000

Residual Chi-square 18.284 with 20 d.f. Sig = 0.567

REGRESSION OUTPUT

Output Created		26 May 00 16:42:12
Comments		
Input	Data	D:\spss\c&botcrx\mergdata\Phall032.sav
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	1185
Syntax		LOGISTIC REGRESSION VAR=drph1st /METHOD=BSTEP(LR) phcode chainind e1yrnogp e2uswtgp e3fargp e4yrnoph e5sameph e6farph e7regrx e8payrx e11ctoff e12genht e13lgill f1sex f6summ f4mstat2 f7carvan f9fted g6pomtop g7blackl f2summ f5summ f8summ e7regrx *f5summ e5sameph*e8payrx e5sameph*g6pomtop prelrx f3age /CONTRAST (phcode)=Deviation(1) /CONTRAST (chainind)=Deviation /CONTRAST (e5sameph)=Deviation /CONTRAST (e7regrx)=Deviation /CONTRAST (e8payrx)=Deviation /CONTRAST (e11ctoff)=Deviation /CONTRAST (e13lgill)=Deviation /CONTRAST (f1sex)=Deviation /CONTRAST (f4mstat2)=Deviation(1) /CONTRAST (f7carvan)=Deviation /CONTRAST (f9fted)=Deviation /CONTRAST (g6pomtop)=Deviation /CONTRAST (g7blackl)=Deviation /CONTRAST (f6summ)=Deviation(1) /CONTRAST (f2summ)=Deviation /CONTRAST (f5summ)=Deviation /CONTRAST (f8summ)=Deviation(1) /CONTRAST (prelrx)=Deviation /CLASSPLOT /PRINT=SUMMARY CI(95) /CRITERIA PIN(.05) POUT(.10) ITERATE(20) CUT(.75) .
Resources	Elapsed Time	0:18:05.00

Number of selected cases: 1185
Number rejected because of missing data: 111
Number of cases included in the analysis: 1074

pendent Variable Encoding:

iginal lue	Internal Value
1.00	0
2.00	1

	Value	Freq	Parameter Coding (1)	(2)
CODE				
roughton St	1	103	-1.000	-1.000
ivingston	2	109	1.000	.000
enicuik	3	30	.000	1.000
alerno	4	102	.000	.000
gate Lloyds	5	71	.000	.000
alry Rd	6	24	.000	.000
lackburn	7	108	.000	.000
t Johns	8	91	.000	.000
alkeith	9	43	.000	.000
Berwick	10	57	.000	.000
Gate Boots	11	151	.000	.000
iddrie Mains	12	34	.000	.000
Linton	13	41	.000	.000
auldhouse	14	16	.000	.000
omely Bank	15	94	.000	.000

		(3)	(4)	(5)
CODE				
roughton St	1	-1.000	-1.000	-1.000
ivingston	2	.000	.000	.000
enicuik	3	.000	.000	.000
alerno	4	1.000	.000	.000
gate Lloyds	5	.000	1.000	.000
alry Rd	6	.000	.000	1.000
lackburn	7	.000	.000	.000
t Johns	8	.000	.000	.000
alkeith	9	.000	.000	.000
Berwick	10	.000	.000	.000
Gate Boots	11	.000	.000	.000
iddrie Mains	12	.000	.000	.000
Linton	13	.000	.000	.000
auldhouse	14	.000	.000	.000
omely Bank	15	.000	.000	.000

		(6)	(7)	(8)
CODE				
roughton St	1	-1.000	-1.000	-1.000
ivingston	2	.000	.000	.000
enicuik	3	.000	.000	.000
alerno	4	.000	.000	.000
gate Lloyds	5	.000	.000	.000
alry Rd	6	.000	.000	.000
lackburn	7	1.000	.000	.000
t Johns	8	.000	1.000	.000
alkeith	9	.000	.000	1.000
Berwick	10	.000	.000	.000
Gate Boots	11	.000	.000	.000
iddrie Mains	12	.000	.000	.000
Linton	13	.000	.000	.000
auldhouse	14	.000	.000	.000
omely Bank	15	.000	.000	.000

		(9)	(10)	(11)
CODE				
roughton St	1	-1.000	-1.000	-1.000
ivingston	2	.000	.000	.000
enicuik	3	.000	.000	.000
alerno	4	.000	.000	.000

t Johns	8	.000	.000	.000
alkeith	9	.000	.000	.000
Berwick	10	1.000	.000	.000
Gate Boots	11	.000	1.000	.000
iddrie Mains	12	.000	.000	1.000
Linton	13	.000	.000	.000
auldhouse	14	.000	.000	.000
omely Bank	15	.000	.000	.000

CODE		(12)	(13)	(14)
roughton St	1	-1.000	-1.000	-1.000
ivingston	2	.000	.000	.000
enicuik	3	.000	.000	.000
alerno	4	.000	.000	.000
gate Lloyds	5	.000	.000	.000
alry Rd	6	.000	.000	.000
lackburn	7	.000	.000	.000
t Johns	8	.000	.000	.000
alkeith	9	.000	.000	.000
Berwick	10	.000	.000	.000
Gate Boots	11	.000	.000	.000
iddrie Mains	12	.000	.000	.000
Linton	13	1.000	.000	.000
auldhouse	14	.000	1.000	.000
omely Bank	15	.000	.000	1.000

SUMM	Value	Freq	Parameter Coding (1)	(2)
n paid work	1.00	440	-1.000	-1.000
ot in paid work	2.00	150	1.000	.000
etired	3.00	306	.000	1.000
/t educ.	4.00	104	.000	.000
omething else	5.00	74	.000	.000

SUMM		(3)	(4)
n paid work	1.00	-1.000	-1.000
ot in paid work	2.00	.000	.000
etired	3.00	.000	.000
/t educ.	4.00	1.000	.000
omething else	5.00	.000	1.000

MSTAT2	Value	Freq	Parameter Coding (1)	(2)
arried/live togeth.	1.00	566	-1.000	-1.000
idowed	2.00	107	1.000	.000
ivorced/sep.	3.00	87	.000	1.000
ingle, never married	4.00	187	.000	.000
/a child	5.00	127	.000	.000

MSTAT2		(3)	(4)
arried/live togeth.	1.00	-1.000	-1.000
idowed	2.00	.000	.000
ivorced/sep.	3.00	.000	.000
ingle, never married	4.00	1.000	.000
/a child	5.00	.000	1.000

SUMM	Value	Freq	Parameter Coding (1)	(2)
ffluent	1.00	293	-1.000	-1.000
verage	2.00	591	1.000	.000
eprived	3.00	190	.000	1.000
TED				
till in f/t educat.	1	169	1.000	.000
18 years	2	731	.000	1.000
18 years	3	174	-1.000	-1.000
POMTOP				
es	1	443	1.000	

ndependent	2	250	-1.000
SAMEPH			
es	1	935	1.000
o	2	139	-1.000
REGRX			
es	1	530	1.000
o	2	544	-1.000
PAYRX			
es	1	454	1.000
o	2	620	-1.000
ICTOFF			
es	1	165	1.000
o	2	909	-1.000
BLGILL			
es	1	395	1.000
o	2	679	-1.000
SEX			
ale	1	403	1.000
emale	2	671	-1.000
BLACKL			
es	1	468	1.000
o	2	606	-1.000
CARVAN			
es	1	769	1.000
o	2	305	-1.000
SUMM			
hite	1.00	1060	1.000
on white	2.00	14	-1.000
SUMM			
ome owner	1.00	722	1.000
enting	2.00	352	-1.000
ELRX			
rice paid less than or equal to the Rx charge	1.00	968	1.000
rice paid more than Rx charge	2.00	106	-1.000

Interactions:

T_1	E7REGRX(1) by F5SUMM(1)
T_2	E5SAMEPH(1) by E8PAYRX(1)
T_3	E5SAMEPH(1) by G6POMTOP(1)

pendent Variable.. DRPH1ST Dr or Ph first CCP

ginning Block Number 0. Initial Log Likelihood Function

Log Likelihood 1219.8311

Constant is included in the model.

ginning Block Number 1. Method: Backward Stepwise (LR)

riable(s) Entered on Step Number

.	PHCODE	pharmacy name
	CHAININD	chain or independent pharmacy
	E1YRNOGP	no times seen gp in last year
	E2USWTGP	usual wait to see a gp
	E3FARGP	how far live from gp surgery
	E4YRNOPH	no times consulted ph in last year
	E5SAMEPH	use the same ph
	E6FARPH	how far live from ph
	E7REGRX	any regular medicines on rx from gp
	E8PAYRX	pay for rx
	E11CTOFF	ever put off by cost of medicines
	E12GENHT	description of general health
	E13LGILL	any longstanding illness
	F1SEX	sex
	F6SUMM	dep. cat. summ
	F4MSTAT2	m stat combined - marr./lvg tgthrv& div./sep.
	F7CARVAN	car or van ownership
	F9FTED	age completed f/t education
	G6POMTOP	pom to p med
	G7BLACKL	med NHS blacklisted
	F2SUMM	ethnic group - summary
	F5SUMM	accom.type - summary
	F8SUMM	emp. cat. - summary
	E7REGRX * F5SUMM	
	E5SAMEPH * E8PAYRX	
	E5SAMEPH * G6POMTOP	
	PRELRX	Price paid realtive to Rx chg
	F3AGE	age

timation terminated at iteration number 7 because
g Likelihood decreased by less than .01 percent.

2 Log Likelihood	579.144
oodness of Fit	829.588
ox & Snell - R^2	.449
agelkerke - R^2	.662

	Chi-Square	df	Significance
odel	640.687	49	.0000
lock	640.687	49	.0000

assification Table for DRPH1ST
e Cut Value is .75

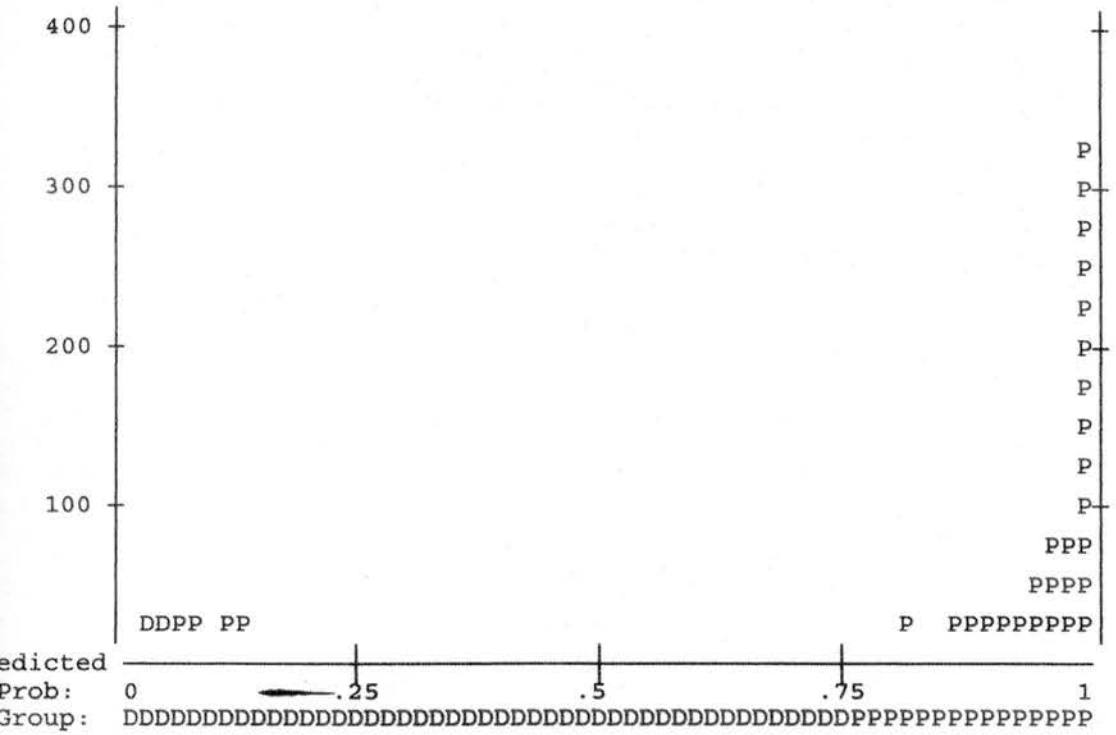
served		Predicted: Doctor first ccp (D)	Predicted: Ph first ccp (P)	Percent Correct
Doctor first ccp	D	242	32	88.32%
Ph first ccp	P	117	683	85.38%
			Overall	86.13%

Variables in the Equation

riable	B	S.E.	Wald	df	Sig	R
CODE			52.5893	14	.0000	.1420
HCODE(1)	1.3487	1.3258	1.0348	1	.3090	.0000
HCODE(2)	6.9774	8.8964	.6151	1	.4329	.0000
HCODE(3)	.0377	2.1191	.0003	1	.9858	.0000
HCODE(4)	-.7722	1.2153	.4038	1	.5251	.0000
HCODE(5)	1.4168	1.5022	.8896	1	.3456	.0000
HCODE(6)	-1.2874	1.2178	1.1176	1	.2904	.0000
HCODE(7)	-1.3584	1.2155	1.2490	1	.2637	.0000
HCODE(8)	.1236	1.2846	.0093	1	.9234	.0000
HCODE(9)	.8161	2.0676	.1558	1	.6931	.0000
HCODE(10)	.3122	1.2234	.0651	1	.7986	.0000
HCODE(11)	-1.2763	2.1525	.3516	1	.5532	.0000
HCODE(12)	-1.8969	2.1195	.8010	1	.3708	.0000
HCODE(13)	-2.1273	2.2065	.9295	1	.3350	.0000
HCODE(14)	-1.4503	1.2515	1.3430	1	.2465	.0000
AININD(1)	-.1943	1.4637	.0176	1	.8944	.0000
YRNOGP	-.2863	.1095	6.8400	1	.0089	-.0630
JSWTGP	.0803	.0764	1.1038	1	.2934	.0000
FARGP	-.0290	.1724	.0284	1	.8662	.0000
YRNOPH	.7390	.1494	24.4544	1	.0000	.1357
SAMEPH(1)	-.6352	.2092	9.2184	1	.0024	-.0769
FARPH	-.2823	.1871	2.2768	1	.1313	-.0151
REGRX(1)	-.5214	.1544	11.3983	1	.0007	-.0878
PAYRX(1)	.4182	.2358	3.1447	1	.0762	.0306
ICTOFF(1)	-.1532	.1652	.8604	1	.3536	.0000
2GENHT	.2059	.1623	1.6097	1	.2045	.0000
BLGILL(1)	-.2829	.1427	3.9297	1	.0474	-.0398
SEX(1)	.0087	.1229	.0050	1	.9437	.0000
SUMM			10.2598	2	.0059	.0716
5SUMM(1)	-.0304	.1953	.0242	1	.8763	.0000
5SUMM(2)	-.8266	.2950	7.8533	1	.0051	-.0693
MSTAT2			7.2201	4	.1247	.0000
4MSTAT2(1)	-6.2E-06	.3580	.0000	1	1.0000	.0000
4MSTAT2(2)	-.4907	.3730	1.7303	1	.1884	.0000
4MSTAT2(3)	.5851	.2602	5.0555	1	.0245	.0500
4MSTAT2(4)	-.4190	.5629	.5542	1	.4566	.0000
CARVAN(1)	-.1896	.1341	1.9987	1	.1574	.0000
FTED			.0098	2	.9951	.0000
9FTED(1)	-.0481	.5861	.0067	1	.9346	.0000
9FTED(2)	.0123	.3360	.0013	1	.9708	.0000
POMTOP(1)	-.1609	.2038	.6235	1	.4297	.0000
BLACKL(1)	1.1770	.1387	72.0216	1	.0000	.2396
SUMM(1)	-.2977	.4938	.3635	1	.5466	.0000
SUMM(1)	.1919	.1422	1.8206	1	.1772	.0000
SUMM			2.5922	4	.6282	.0000
3SUMM(1)	-.2994	.3696	.6563	1	.4179	.0000
3SUMM(2)	.0477	.4291	.0124	1	.9115	.0000
3SUMM(3)	.3078	.5394	.3255	1	.5683	.0000
3SUMM(4)	-.2689	.4475	.3610	1	.5480	.0000
REGRX(1) by F5SUMM(1)	-.2254	.1208	3.4848	1	.0619	-.0349
_2	.4894	.2007	5.9445	1	.0148	.0569
_3	.2656	.1990	1.7807	1	.1821	.0000
ELRX(1)	-.3841	.2461	2.4358	1	.1186	-.0189
AGE	.0027	.0115	.0530	1	.8180	.0000
nstant	2.2530	1.3189	2.9180	1	.0876	

riable	Exp(B)	Lower	Upper
CODE(1)	3.8522	.2866	51.7867
CODE(2)	1072.1189	.0000	4.007E+10
CODE(3)	1.0384	.0163	66.0968
CODE(4)	.4620	.0427	5.0010
CODE(5)	4.1239	.2171	78.3342
CODE(6)	.2760	.0254	3.0023
CODE(7)	.2571	.0237	2.7841
CODE(8)	1.1315	.0913	14.0308
CODE(9)	2.2616	.0393	130.1117
CODE(10)	1.3664	.1242	15.0291
CODE(11)	.2791	.0041	18.9625
CODE(12)	.1500	.0024	9.5569
CODE(13)	.1192	.0016	9.0016
CODE(14)	.2345	.0202	2.7252
AININD(1)	.8234	.0467	14.5049
YRNOGP	.7510	.6060	.9308
USWTGP	1.0836	.9329	1.2586
FARGP	.9714	.6928	1.3620
YRNOPH	2.0939	1.5623	2.8066
SAMEPH(1)	.5298	.3516	.7984
FARPH	.7541	.5226	1.0880
REGRX(1)	.5937	.4387	.8036
PAYRX(1)	1.5192	.9569	2.4119
1CTOFF(1)	.8580	.6207	1.1859
2GENHT	1.2286	.8939	1.6887
3LGILL(1)	.7536	.5697	.9968
SEX(1)	1.0087	.7928	1.2835
SUMM(1)	.9700	.6615	1.4225
SUMM(2)	.4375	.2454	.7800
MSTAT2(1)	1.0000	.4957	2.0173
MSTAT2(2)	.6122	.2947	1.2718
MSTAT2(3)	1.7952	1.0780	2.9898
MSTAT2(4)	.6577	.2182	1.9821
CARVAN(1)	.8273	.6360	1.0760
FTED(1)	.9531	.3022	3.0059
FTED(2)	1.0124	.5240	1.9558
POMTOP(1)	.8513	.5710	1.2694
BLACKL(1)	3.2446	2.4724	4.2581
SUMM(1)	.7425	.2821	1.9545
SUMM(1)	1.2115	.9168	1.6009
SUMM(1)	.7413	.3592	1.5295
SUMM(2)	1.0489	.4523	2.4320
SUMM(3)	1.3604	.4726	3.9161
SUMM(4)	.7642	.3179	1.8372
REGRX(1) by F5SUMM(1)	.7982	.6299	1.0113
T_2	1.6313	1.1007	2.4176
T_3	1.3042	.8830	1.9263
ELRX(1)	.6811	.4205	1.1032
AGE	1.0027	.9803	1.0255

Observed Groups and Predicted Probabilities



Predicted Probability is of Membership for Ph first ccp
The Cut Value is .75
Symbols: D - Doctor first ccp
P - Ph first ccp
Each Symbol Represents 25 Cases.

ep	Improv. Chi-Sq.	df	sig	Model Chi-Sq.	df	sig	Correct Class %	Variable
2	-.010	2	.995	640.677	47	.000	86.13	OUT: F9FTED
3	-.005	1	.943	640.672	46	.000	86.22	OUT: F1SEX
4	-.017	1	.896	640.655	45	.000	86.22	OUT: CHAININD
5	-.028	1	.867	640.627	44	.000	86.13	OUT: E3FARGP
6	-.071	1	.791	640.556	43	.000	86.31	OUT: F3AGE
7	-3.104	4	.541	637.453	39	.000	86.03	OUT: F8SUMM
8	-.487	1	.485	636.966	38	.000	86.03	OUT: F2SUMM
9	-.689	1	.406	636.277	37	.000	86.31	OUT: G6POMTOP
10	-.916	1	.338	635.361	36	.000	86.03	OUT: E11CTOFF
11	-1.063	1	.303	634.298	35	.000	86.13	OUT: E2USWTGP
12	-1.329	1	.249	632.969	34	.000	86.22	OUT: E12GENHT
13	-1.246	1	.264	631.722	33	.000	85.85	OUT: E5SAMEPH * G6POMTOP
14	-2.155	1	.142	629.567	32	.000	85.94	OUT: PRELRX
15	-2.173	1	.140	627.394	31	.000	85.94	OUT: E6FARPH
16	-2.268	1	.132	625.126	30	.000	85.66	OUT: F5SUMM
17	-1.400	1	.237	623.726	29	.000	85.29	OUT: E7REGRX * F5SUMM
18	-1.632	1	.201	622.094	28	.000	85.66	OUT: F7CARVAN

more variables can be deleted or added.

d Block Number 1 PIN = .0500 Limits reached.

nal Equation for Block 1

timation terminated at iteration number 7 because
g Likelihood decreased by less than .01 percent.

2 Log Likelihood	597.737
oodness of Fit	782.942
ox & Snell - R^2	.440
agelkerke - R^2	.648

	Chi-Square	df	Significance
odel	622.094	27	.0000
lock	622.094	28	.0000
tep	-1.632	1	.2014

assification Table for DRPHIST
e Cut Value is .75

served		Predicted: Doctor first ccp (D)	Predicted: Ph first ccp (P)	Percent Correct
Doctor first ccp	D	242	32	88.32%
Ph first ccp	P	122	678	84.75%
			Overall	85.66%

---------- Variables in the Equation ----------

riable	B	S.E.	Wald	df	Sig	R
CODE			58.4382	14	.0000	.1580
HCODE(1)	1.1908	.8809	1.8273	1	.1764	.0000
HCODE(2)	6.7147	8.9604	.5616	1	.4536	.0000
HCODE(3)	.4135	.8323	.2468	1	.6194	.0000
HCODE(4)	-.8067	.7369	1.1982	1	.2737	.0000
HCODE(5)	.9528	1.0858	.7700	1	.3802	.0000
HCODE(6)	-1.4672	.7592	3.7344	1	.0533	-.0377
HCODE(7)	-1.4553	.7144	4.1494	1	.0416	-.0420
HCODE(8)	.0864	.8207	.0111	1	.9161	.0000
HCODE(9)	1.0341	.8099	1.6304	1	.2016	.0000
HCODE(10)	.2881	.7259	.1575	1	.6915	.0000
HCODE(11)	-1.1347	.8244	1.8947	1	.1687	.0000
HCODE(12)	-1.5453	.8361	3.4155	1	.0646	-.0341
HCODE(13)	-2.0591	.9994	4.2449	1	.0394	-.0429
HCODE(14)	-1.2460	.7418	2.8210	1	.0930	-.0259
YRNOGP	-.2877	.1032	7.7663	1	.0053	-.0688
YRNOPH	.6764	.1407	23.1150	1	.0000	.1316
SAMEPH(1)	-.5707	.1978	8.3274	1	.0039	-.0720
REGRX(1)	-.4459	.1430	9.7179	1	.0018	-.0795
PAYRX(1)	.5280	.2019	6.8425	1	.0089	.0630
BLGILL(1)	-.2745	.1298	4.4749	1	.0344	-.0450
SUMM			10.1243	2	.0063	.0709
6SUMM(1)	-.0572	.1899	.0906	1	.7634	.0000
6SUMM(2)	-.7476	.2811	7.0742	1	.0078	-.0645
MSTAT2			11.3466	4	.0229	.0524
4MSTAT2(1)	.2148	.2716	.6251	1	.4291	.0000
4MSTAT2(2)	-.4281	.3381	1.6035	1	.2054	.0000
4MSTAT2(3)	.5277	.2343	5.0742	1	.0243	.0502
4MSTAT2(4)	-.6626	.2972	4.9691	1	.0258	-.0493
BLACKL(1)	1.0989	.1267	75.2441	1	.0000	.2450
T_2	.4816	.1909	6.3624	1	.0117	.0598
nstant	2.0926	.7849	7.1086	1	.0077	

riable	Exp(B)	95% CI for Exp(B) Lower	Upper
CODE(1)	3.2899	.5852	18.4942
CODE(2)	824.4239	.0000	3.493E+10
CODE(3)	1.5120	.2959	7.7275
CODE(4)	.4463	.1053	1.8921
CODE(5)	2.5931	.3087	21.7814
CODE(6)	.2306	.0521	1.0211
CODE(7)	.2333	.0575	.9464
CODE(8)	1.0903	.2182	5.4471
CODE(9)	2.8125	.5751	13.7548
CODE(10)	1.3338	.3215	5.5329
CODE(11)	.3215	.0639	1.6177
CODE(12)	.2132	.0414	1.0980
CODE(13)	.1276	.0180	.9046
CODE(14)	.2877	.0672	1.2312
YRNOGP	.7500	.6126	.9182
YRNOPH	1.9668	1.4928	2.5913
SAMEPH(1)	.5651	.3835	.8327
REGRX(1)	.6403	.4837	.8474
PAYRX(1)	1.6956	1.1416	2.5186
BLGILL(1)	.7599	.5893	.9800
SUMM(1)	.9444	.6509	1.3703
SUMM(2)	.4735	.2729	.8214
MSTAT2(1)	1.2396	.7279	2.1110
MSTAT2(2)	.6517	.3360	1.2643
MSTAT2(3)	1.6950	1.0710	2.6827
MSTAT2(4)	.5155	.2879	.9231
BLACKL(1)	3.0010	2.3411	3.8468
T_2	1.6187	1.1134	2.3534

Appendix 5:

Chapter 5 - Results

Constituent user, GP, CP and NHS time costs (minutes) across the range of consultation routes adopted by users to access P medicines

TABLE A5.1: USER TIME COSTS (MINUTES) IN EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

First Consultation: P medicine on Rx in GP Appointment (N=176)							
Activity	***Mean***	**Median**	**Mode**	**Range**	**Min**	**Max**	***Sum*** **(Hrs)**
Waiting time in GP surgery	**14**	10	5	90	0	90	**2405 (40)**
Consulting time with GP	**12**	10	10	35	5	40	**2079 (35)**
Travel time to GP surgery	**10**	10	10	60	0	60	**1805 (30)**
Special arrangement time attend GP	**180**	120	120	360	120	480	**3000 (50)**
Travel time to CP	**8**	5	5	35	5	40	**1480 (25)**
Waiting time at CP	**8**	5	5	90	0	90	**1405 (23)**
Special arrangement time attend CP	**200**	120	120	360	120	480	**1800 (30)**
First Consultation: P Medicine on Repeat Rx from GP (N=127)							
Activity	***Mean***	**Median**	**Mode**	**Range**	**Min**	**Max**	***Sum*** **(Hrs)**
Travel time to GP surgery	**12**	10	10	85	5	90	**1320 (22)**
Waiting time in GP surgery	**3**	0	0	30	0	30	**280 (5)**
Special arrangement time attend GP	**223**	120	120	720	120	840	**1560 (26)**
Travel time to CP	**10**	10	10	55	5	60	**1220 (20)**
Waiting time at CP	**6**	5	5	20	0	20	**800 (13)**
Special arrangement time attend CP	**264**	120	120	720	120	840	**1320 (22)**
First Consultation: P Medicine Bought OTC at CP (N=882)							
Activity	***Mean***	**Median**	**Mode**	**Range**	**Min**	**Max**	***Sum*** **(Hrs)**
Travel time to CP	**10**	10	10	85	5	90	**9195 (153)**
Waiting time at CP	**0.5**	0	0	15	0	15	**340 (6)**
Special arrangement time attend CP	**145**	120	120	120	120	240	**2040 (34)**
Waiting time in GP surgery	**13**	10	5	90	0	90	**975 (16)**

Consulting time with GP	**11**	10	10	55	5	60	**865 (14)**
Travel time to GP surgery	**12**	10	10	35	5	40	**885 (15)**
Special arrangement time attend GP	**5**	120	120	1320	120	1440	**2520 (42)**
Follow Up Consultation: GP Appointment (N=122)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	***Sum* (Hrs)**
Waiting time in GP surgery	**28**	15	15	90	0	90	**3445 (57)**
Consulting time with GP	**13**	10	10	55	5	60	**1590 (27)**
Travel time to GP surgery	**12**	10	10	40	5	45	**1400 (23)**
Special arrangement time attend GP	**182**	120	120	360	120	480	**5280 (88)**
Travel time to CP	**8**	5	5	15	5	20	**775 (13)**
Waiting time at CP	**10**	10	5	90	0	90	**1025 (17)**
Special arrangement time attend CP	**120**	120	120	0	120	120	**720 (12)**
Follow Up Consultation: CP Consultation (N=44)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	***Sum* (Hrs)**
Travel time to CP	**12**	10	5	30	5	35	**520 (9)**
Waiting time at CP	**4**	5	5	20	0	20	**185 (3)**
Special arrangement time attend CP	**120**	120	120	0	120	120	**120 (2)**

Note: the key figures of interest are the mean and total time costs accruing to users. These are highlighted in bold. Other summary statistics are included as a reference source for future researchers interested in costing the provision of P medicines in primary care.

TABLE A5.2: GP TIME COSTS (MINUTES) IN EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

First Consultation: P medicine on Rx in GP Appointment (N=176)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Consulting time with GP	**12**	10	10	35	5	40	**2079 (35)**
First Consultation: P Medicine on Repeat Rx from GP (N=127)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Administration of posting by GP	**1.5**	1.5	1.5	0	1.5	1.5	**200 (3)**
Signing repeat prescriptions by GP	**5**	5	5	0	5	5	**635 (11)**
First Consultation: P Medicine Bought OTC at CP (N=882)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Consulting time with GP	**0**	0	0	0	0	0	**0 (0)**
Follow Up Consultation: GP Appointment (N=122)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Consulting time with GP	**13**	10	10	55	5	60	**1590 (27)**
Follow Up Consultation: CP Consultation (N=44)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Consulting time with GP	**0**	0	0	0	0	0	**0 (0)**

Note: the key figures of interest are the mean and total time costs accruing to users. These are highlighted in bold. Other summary statistics are included as a reference source for future researchers interested in costing the provision of P medicines in primary care.

TABLE A5.3: CP TIME COSTS (MINUTES) IN EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

First Consultation: P medicine on Rx in GP Appointment (N=176)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Prescription dispensing (low)	**2.5**	2.5	2.5	0	2.5	2.5	**440 (7)**
(mid)	**3.5**	3.5	3.5	0	3.5	3.5	**616 (10)**
(high)	**5.0**	5.0	5.0	0	5.0	5.0	**880 (15)**
Prescription advice (low)	**0.2**	0.2	0.2	0	0.2	0.2	**35 (1)**
(mid)	**0.3**	0.3	0.3	0	0.3	0.3	**53 (1)**
(high)	**0.4**	0.4	0.4	0	0.4	0.4	**70 (1)**
First Consultation: P Medicine on Repeat Rx from GP (N=127)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Repeat Rx dispensing (low)	**2.5**	2.5	2.5	0	2.5	2.5	**318 (5)**
(mid)	**3.5**	3.5	3.5	0	3.5	3.5	**445 (7)**
(high)	**5.0**	5.0	5.0	0	5.0	5.0	**635 (11)**
Repeat Rx advice (low)	**0.2**	0.2	0.2	0	0.2	0.2	**25 (0.5)**
(mid)	**0.3**	0.3	0.3	0	0.3	0.3	**38 (1)**
(high)	**0.4**	0.4	0.4	0	0.4	0.4	**51 (1)**
First Consultation: P Medicine Bought OTC at CP (N=882)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Advice P meds. OTC (low)	**0.5**	0.5	0.5	0	0.5	0.5	**441 (7)**
(mid)	**1.0**	1.0	1.0	0	1.0	1.0	**882 (15)**
(high)	**2.5**	2.5	2.5	0	2.5	2.5	**2205 (37)**
Follow Up Consultation: GP Appointment (N=122)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Prescription dispensing (low)	**2.5**	2.5	2.5	0	2.5	2.5	**305 (5)**
(mid)	**3.5**	3.5	3.5	0	3.5	3.5	**427 (7)**
(high)	**5.0**	5.0	5.0	0	5.0	5.0	**610 (10)**
Prescription advice (low)	**0.2**	0.2	0.2	0	0.2	0.2	**24 (0.5)**

(mid)	**0.3**	0.3	0.3	0	0.3	0.3	**36 (1)**
(high)	**0.4**	0.4	0.4	0	0.4	0.4	**48 (1)**
Advice on P med. OTC (low)	**0.5**	0.5	0.5	0	0.5	0.5	**2 (-)**
(mid)	**1.0**	1.0	1.0	0	1.0	1.0	**4 (-)**
(high)	**2.5**	2.5	2.5	0	2.5	2.5	**10 (-)**
Follow Up Consultation: CP Consultation (N=44)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
Advice on P med. OTC (low)	**0.5**	0.5	0.5	0	0.5	0.5	**22 (0.5)**
(mid)	**1.0**	1.0	1.0	0	1.0	1.0	**44 (1)**
(high)	**2.5**	2.5	2.5	0	2.5	2.5	**110 (2)**

Note: the key figures of interest are the mean and total time costs accruing to users. These are highlighted in bold. Other summary statistics are included as a reference source for future researchers interested in costing the provision of P medicines in primary care.

TABLE A5.4: SUMMARY MONEY COSTS (£) ACCRUING TO KEY STAKEHOLDERS IN EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

First Consultation: P medicine on Rx in GP Appointment (N=176)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. special arr. (l)	5.88	3.60	2.40	64.72	1.20	65.92	1035
User incl. special arr. (m)	10.41	7.10	4.80	128.12	2.40	130.52	1832
User incl. special arr. (h)	12.98	9.00	6.00	155.90	3.00	158.90	2284
User excl. special arr. (l)	4.62	3.95	3.79	30.39	0.30	30.69	813
User excl. special arr. (m)	6.14	5.19	4.39	32.39	0.60	32.99	1081
User excl. special arr. (h)	7.03	5.90	4.50	33.79	0.75	34.54	1237
General practitioner (l)	9.80	8.30	8.30	29.05	4.15	33.20	1726
General practitioner (m)	14.77	12.50	12.50	43.75	6.25	50.00	2599
General practitioner (h)	19.14	16.20	16.20	56.70	8.10	64.80	3368
Community pharmacist (l)	12.64	10.97	7.68	40.30	6.97	47.28	2225
Community pharmacist (m)	13.49	11.82	8.52	40.30	7.82	48.12	2374
Community pharmacist (h)	14.91	13.24	9.94	40.30	9.24	49.54	2624
National Health Service (l)	22.44	19.27	15.98	44.45	11.12	55.58	3950
National Health Service (m)	28.25	24.32	21.03	56.44	14.07	70.51	4972
National Health Service (h)	34.04	29.44	26.15	69.39	17.34	86.73	5991
First Consultation: P Medicine on Repeat Rx from GP (N=127)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. special arr. (l)	4.37	2.20	2.30	155.46	0.30	155.76	555
User incl. special arr. (m)	7.62	4.40	1.20	290.76	0.60	291.36	968
User incl. special arr. (h)	9.53	5.70	4.50	362.45	0.75	363.20	1210
User excl. special arr. (l)	2.81	2.10	1.50	19.70	0.30	20.00	357
User excl. special arr. (m)	4.88	4.20	3.00	22.00	0.60	22.60	620
User excl. special arr. (h)	6.09	5.40	4.50	23.55	0.75	24.30	774
General practitioner (l)	4.29	4.15	4.15	0.88	4.15	5.03	545
General practitioner (m)	6.48	6.25	6.25	1.48	6.25	7.73	823
General practitioner (h)	8.43	8.10	8.10	2.08	8.10	10.18	1070
Community pharmacist (l)	14.43	11.79	9.68	34.43	0.86	35.29	1833
Community pharmacist (m)	15.28	12.64	10.52	34.43	1.71	36.14	1941
Community pharmacist (h)	16.76	14.11	12.00	34.43	3.19	37.61	2128
National Health Service (l)	18.72	15.94	13.83	34.43	5.01	39.44	2378
National Health Service (m)	21.76	18.89	16.77	34.43	7.96	42.39	2764
National Health Service (h)	25.18	22.11	20.10	34.43	11.29	45.71	3198
First Consultation: P Medicine Bought OTC at CP (N=882)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. special arr. (l)	5.24	4.29	3.79	90.78	0.95	91.73	4623
User incl. special arr. (m)	6.62	5.15	4.39	187.68	1.25	188.93	5839
User incl. special arr. (h)	7.41	5.69	4.69	230.25	1.40	231.65	6536
User excl. special arr. (l)	4.94	4.29	3.79	29.74	0.95	30.69	4358
User excl. special arr. (m)	6.00	5.10	4.39	31.74	1.25	32.99	5296
User excl. special arr. (h)	6.65	5.65	4.69	33.14	1.40	34.54	5867
General practitioner (l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General practitioner (m)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General practitioner (h)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Community pharmacist (l)	0.16	0.16	0.16	0.00	0.16	0.16	141
Community pharmacist (m)	0.45	0.45	0.45	0.00	0.45	0.45	397
Community pharmacist (h)	1.48	1.48	1.48	0.00	1.48	1.48	1301
National Health Service (l)	9.61	8.46	8.46	0.16	5.31	49.96	859
National Health Service (m)	14.68	12.95	12.95	0.45	6.80	75.45	1478
National Health Service (h)	19.92	17.68	17.68	1.48	9.58	98.68	2702

Follow-up Consultation: GP Appointment (N=122)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. special arr. (l)	12.20	7.95	2.80	70.76	1.30	72.06	1488
User incl. special arr. (m)	20.39	12.40	5.60	121.96	2.60	124.56	2488
User incl. special arr. (h)	25.07	14.50	7.20	151.60	3.45	155.05	3058
User excl. special arr. (l)	4.42	3.99	1.80	16.79	0.90	17.69	539
User excl. special arr. (m)	6.21	5.17	3.60	17.14	1.25	18.39	757
User excl. special arr. (h)	7.24	6.00	4.50	17.85	1.40	19.25	883
General practitioner (l)	10.82	8.30	8.30	45.65	4.15	49.80	1320
General practitioner (m)	16.29	12.50	12.50	68.75	6.25	75.00	1988
General practitioner (h)	21.11	16.20	16.20	89.10	8.10	97.20	2576
Community pharmacist (l)	14.69	11.23	11.23	56.66	10.38	67.04	1498
Community pharmacist (m)	14.77	11.30	11.30	56.44	10.67	67.11	1506
Community pharmacist (h)	14.90	11.40	11.40	55.81	11.40	67.21	1520
National Health Service (l)	23.10	19.53	19.53	71.19	4.15	75.34	2818
National Health Service (m)	28.64	23.80	23.80	80.05	6.25	86.30	3494
National Health Service (h)	33.57	27.60	27.60	100.50	8.10	108.60	4096
Follow-up Consultation: CP Consultation (N=44)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	5.90	5.45	4.85	18.00	1.59	19.59	260
User incl. Special arr. (m)	7.22	6.57	6.57	18.09	2.10	20.19	318
User incl. Special arr. (h)	7.96	7.33	5.75	20.10	2.25	22.35	350
User excl. special arr. (l)	5.86	4.64	4.55	20.69	1.60	22.29	258
User excl. special arr. (m)	7.17	5.58	3.65	22.90	2.69	25.59	316
User excl. special arr. (h)	7.96	6.30	4.20	24.25	2.99	27.24	350
General practitioner (l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General practitioner (m)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
General practitioner (h)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Community pharmacist (l)	0.16	0.16	0.16	0.00	0.16	0.16	7
Community pharmacist (m)	0.45	0.45	0.45	0.00	0.45	0.45	20
Community pharmacist (h)	1.48	1.48	1.48	0.00	1.48	1.48	65
National Health Service (l)	0.16	0.16	0.16	0.00	0.16	0.16	7
National Health Service (m)	0.45	0.45	0.45	0.00	0.45	0.45	20
National Health Service (h)	1.48	1.48	1.48	0.00	1.48	1.48	65

Note: 'l' denotes low estimate; 'm' denotes mid estimate; 'h' denotes high estimate

TABLE A5.5: USER MONEY COSTS (£) IN EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

First Consultation: P medicine on Rx in GP Appointment (N=176)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Waiting time GP surgery (l)	0.82	0.60	0.30	5.40	0.00	5.40	144
Waiting time GP surgery (m)	1.64	1.20	0.60	10.80	0.00	10.80	289
Waiting time GP surgery (h)	2.05	1.50	0.75	13.50	0.00	13.50	361
Consulting time with GP (l)	0.71	0.60	0.60	2.10	0.30	2.40	125
Consulting time with GP (m)	1.42	1.20	1.20	4.20	0.60	4.80	250
Consulting time with GP (h)	1.77	1.50	1.50	5.25	0.75	6.00	312
Travel method to GP (l)	0.23	0.00	0.00	3.00	0.00	3.00	40
Travel method to GP (m)	0.41	0.00	0.00	4.00	0.00	4.00	72
Travel method to GP (h)	0.59	0.00	0.00	5.00	0.00	5.00	104
Travel time GP surgery (l)	0.62	0.60	0.60	3.60	0.00	3.60	108
Travel time GP surgery (m)	1.23	1.20	1.20	7.20	0.00	7.20	217
Travel time GP surgery (h)	1.54	1.50	1.50	9.00	0.00	9.00	271
Special arr. attend GP (l)	10.15	7.07	7.00	21.56	7.00	28.56	162
Special arr. attend GP (m)	17.40	12.42	10.00	49.36	10.00	59.36	278
Special arr. attend GP (h)	21.94	15.60	13.00	59.80	13.00	72.80	351
Travel method to CP (l)	0.14	0.00	0.00	0.50	0.00	0.50	25
Travel method to CP (m)	0.26	0.00	0.00	0.80	0.00	0.80	47
Travel method to CP (h)	0.30	0.00	0.00	1.20	0.00	0.00	68
Travel time to CP (l)	0.50	0.30	0.30	2.10	0.30	2.40	89
Travel time to CP (m)	1.01	0.60	0.60	4.20	0.60	4.80	178
Travel time to CP (h)	1.26	0.75	0.75	5.25	0.75	6.00	222
Waiting time at CP (l)	0.48	0.30	0.30	5.40	0.00	5.40	84
Waiting time at CP (m)	0.96	0.60	0.60	10.80	0.00	10.80	169
Waiting time at CP (h)	1.20	0.75	0.75	13.50	0.00	13.50	211
Special arr. attend CP (l)	12.54	7.00	7.00	21.56	7.00	28.56	113
Special arr. attend CP (m)	21.00	10.00	10.00	49.36	10.00	59.36	189
Special arr. attend CP (h)	26.58	13.00	13.00	59.80	13.00	72.80	239
Prescription fee (l)	6.90	5.80	5.80	5.80	5.80	11.60	145
Prescription fee (m)	6.90	5.80	5.80	5.80	5.80	11.60	145
Prescription fee (h)	6.90	5.80	5.80	5.80	5.80	11.60	145
First Consultation: P Medicine on Repeat Rx from GP (N=127)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Travel method to GP (l)	0.22	0.00	0.00	3.00	0.00	3.00	24
Travel method to GP (m)	0.41	0.00	0.00	4.00	0.00	4.00	44
Travel method to GP (h)	0.60	0.00	0.00	5.00	0.00	5.00	64
Travel time GP surgery (l)	0.74	0.60	0.60	5.10	0.30	5.40	79
Travel time GP surgery (m)	1.48	1.20	1.20	10.20	0.60	10.80	158
Travel time GP surgery (h)	1.85	1.50	1.50	12.75	0.75	13.50	198
Waiting time GP surgery (l)	0.16	0.00	0.00	1.80	0.00	1.80	16.80
Waiting time GP surgery (m)	0.31	0.00	0.00	3.60	0.00	3.60	34
Waiting time GP surgery (h)	0.39	0.00	0.00	4.50	0.00	4.50	42
Special arr. attend GP (l)	17.75	7.00	7.00	42.98	7.00	49.98	71
Special arr. attend GP (m)	33.47	10.00	10.00	93.88	10.00	103.88	134
Special arr. Attend GP (h)	41.60	13.00	13.00	114.40	13.00	127.40	166.40
Travel method to CP (l)	0.37	0.00	0.00	3.00	0.00	3.00	47
Travel method to CP (m)	0.57	0.00	0.00	4.00	0.00	4.00	72
Travel method to CP (h)	0.76	0.00	0.00	5.00	0.00	5.00	97
Travel time to CP (l)	0.57	0.60	0.60	3.30	0.30	3.60	73

Travel time to CP (m)	1.15	1.20	1.20	6.60	0.60	7.20	146
Travel time to CP (h)	1.44	1.50	1.50	8.25	0.75	9.00	183
Waiting time at CP (l)	0.39	0.30	0.30	1.20	0.00	1.20	48
Waiting time at CP (m)	0.76	0.60	0.60	2.40	0.00	2.40	96
Waiting time at CP (h)	0.94	0.75	0.75	3.00	0.00	3.00	120
Special arr. Attend CP (l)	25.39	7.00	7.00	91.98	7.00	98.98	127
Special arr. Attend CP(m)	42.77	10.00	10.00	163.88	10.00	173.88	214
Special arr. Attend CP (h)	54.08	13.00	13.00	205.40	13.00	218.40	270
Prescription fee (l)	8.70	5.80	5.80	11.60	5.80	17.40	70
Prescription fee (m)	8.70	5.80	5.80	11.60	5.80	17.40	70
Prescription fee (h)	8.70	5.80	5.80	11.60	5.80	17.40	70
First Consultation: P Medicine Bought OTC at CP (N=882)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Travel method to CP (l)	0.24	0.40	0.40	3.00	0.00	3.00	210
Travel method to CP (m)	0.45	0.75	0.80	4.00	0.00	4.00	395
Travel method to CP (h)	0.65	1.00	1.20	5.00	0.00	5.00	581
Travel time to CP (l)	0.63	0.60	0.60	5.10	0.30	5.40	552
Travel time to CP (m)	1.25	1.20	1.20	10.20	0.60	10.80	1103
Travel time to CP (h)	1.56	1.50	1.50	12.75	0.75	13.50	1379
Waiting time at CP (l)	0.02	0.00	0.00	0.90	0.00	0.90	20
Waiting time at CP (m)	0.05	0.00	0.00	1.80	0.00	1.80	41
Waiting time at CP (h)	0.06	0.00	0.00	2.25	0.00	2.25	51
Special arr. Attend CP (l)	9.50	7.14	7.14	7.28	7.00	14.28	114
Special arr. Attend CP(m)	18.98	14.84	14.84	19.68	10.00	29.68	228
Special arr. attend CP (h)	23.40	18.20	18.20	23.40	13.00	36.40	281
Waiting time at GP (l)	0.77	0.60	0.30	5.40	0.00	5.40	59
Waiting time at GP (m)	1.54	1.20	0.60	10.80	0.00	10.80	117
Waiting time at GP (h)	1.92	1.50	0.75	13.50	0.00	13.50	146
Consulting time with GP (l)	0.68	0.60	0.60	3.30	0.30	3.60	52
Consulting time with GP (m)	1.37	1.20	1.20	6.60	0.60	7.20	104
Consulting time with GP (h)	1.71	1.50	1.50	8.25	0.75	9.00	130
Travel method to GP (l)	0.33	0.40	0.40	3.00	0.00	3.00	25
Travel method to GP (m)	0.60	0.80	0.80	4.00	0.00	4.00	45
Travel method to GP (h)	0.86	1.20	1.20	5.00	0.00	5.00	65
Travel time GP surgery (l)	0.69	0.60	0.60	2.10	0.30	2.40	53
Travel time GP surgery (m)	1.40	1.20	1.20	4.20	0.60	4.80	106
Travel time GP surgery (h)	1.75	1.50	1.50	5.25	0.75	6.00	133
Special arr. attend GP (l)	18.74	7.14	7.14	78.54	7.14	85.68	150
Special arr. attend GP (m)	38.96	14.84	14.84	163.24	14.84	178.04	312
Special arr. attend GP (h)	47.78	18.20	18.20	200.20	18.20	218.40	382
OTC medicine price (l)	3.84	3.29	3.19	28.04	0.35	28.39	3388
OTC medicine price (m)	3.84	3.29	3.19	28.04	0.35	28.39	3388
OTC medicine price (h)	3.84	3.29	3.19	28.04	0.35	28.39	3388
Follow Up Consultation: GP Appointment (N=122)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Waiting time GP surgery (l)	1.69	0.90	0.90	5.40	0.00	5.40	207
Waiting time GP surgery (m)	3.39	1.80	1.80	10.80	0.00	10.80	413
Waiting time GP surgery (h)	4.24	2.25	2.25	13.50	0.00	13.50	517
Consulting time with GP (l)	0.78	0.60	0.60	3.30	0.30	3.60	95
Consulting time with GP (m)	1.56	1.20	1.20	6.60	0.60	7.20	191
Consulting time with GP (h)	1.95	1.50	1.50	8.25	0.75	9.00	239
Travel method to GP (l)	0.42	0.40	0.40	3.00	0.00	3.00	51
Travel method to GP (m)	0.70	0.80	0.80	4.00	0.00	4.00	85
Travel method to GP (h)	0.98	1.20	1.20	5.00	0.00	5.00	119

Travel time GP surgery (l)	0.69	0.60	0.60	2.40	0.30	2.70	84
Travel time GP surgery (m)	1.38	1.20	1.20	4.80	0.60	5.40	168
Travel time GP surgery (h)	1.72	1.50	1.50	6.00	0.75	6.75	210
Special arr. time GP (l)	19.98	14.14	14.14	49.56	7.00	56.56	379
Special arr. time GP (m)	34.62	24.84	24.84	89.36	10.00	99.36	1004
Special arr. time GP (h)	43.58	31.20	31.20	111.80	13.00	124.80	1264
OTC medicine price (l)	4.60	4.70	1.20	6.60	1.20	7.80	18.40
OTC medicine price (m)	4.60	4.70	1.20	6.60	1.20	7.80	18.40
OTC medicine price (h)	4.60	4.70	1.20	6.60	1.20	7.80	18.40
Travel method to CP (l)	0.13	0.00	0.00	3.00	0.00	3.00	13
Travel method to CP (m)	0.23	0.00	0.00	4.00	0.00	4.00	23
Travel method to CP (h)	0.33	0.00	0.00	5.00	0.00	5.00	33
Travel time to CP (l)	0.46	0.30	0.30	0.90	0.30	1.20	47
Travel time to CP (m)	0.91	0.60	0.60	1.80	0.60	2.40	93
Travel time to CP (h)	1.13	0.75	0.75	2.25	0.75	3.00	116
Waiting time at CP (l)	0.60	0.60	0.30	5.40	0.00	5.40	62
Waiting time at CP (m)	1.21	1.20	0.60	10.80	0.00	10.80	123
Waiting time at CP (h)	1.51	1.50	0.75	13.50	0.00	13.50	154
Special arr. attend CP (l)	7.09	7.14	7.14	0.14	7.00	7.14	43
Special arr. attend CP (m)	13.23	14.84	14.84	4.84	10.00	14.84	79
Special arr. attend CP (h)	16.47	18.20	18.20	5.20	13.00	18.20	99
Prescription fee (l)	8.53	5.80	5.80	29.00	5.80	34.80	290
Prescription fee (m)	8.53	5.80	5.80	29.00	5.80	34.80	290
Prescription fee (h)	8.53	5.80	5.80	29.00	5.80	34.80	290
Follow Up Consultation: CP Consultation (N=44)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Travel method to CP (l)	0.21	0.20	0.00	0.50	0.00	0.50	9
Travel method to CP (m)	0.40	0.38	0.00	0.80	0.00	0.80	17
Travel method to CP (h)	0.58	0.50	0.00	1.20	0.00	1.20	26
Travel time to CP (l)	0.71	0.60	0.30	1.80	0.30	2.10	31
Travel time to CP (m)	1.42	1.20	0.60	3.60	0.60	4.20	62
Travel time to CP (h)	1.77	1.50	0.75	4.50	0.75	5.25	78
Waiting time at CP (l)	0.25	0.30	0.30	1.20	0.00	1.20	11
Waiting time at CP (m)	0.50	0.60	0.60	2.40	0.00	2.40	22
Waiting time at CP (h)	0.63	0.75	0.75	3.00	0.00	3.00	28
Special arr. time CP (l)	7.14	7.14	7.14	0.00	7.14	7.14	7.14
Special arr. time CP (m)	14.84	14.84	14.84	0.00	14.84	14.84	14.84
Special arr. time CP (h)	18.20	18.20	18.20	0.00	18.20	18.20	18.20
OTC medicine price (l)	4.57	4.20	4.57	18.30	0.69	18.99	201
OTC medicine price (m)	4.57	4.20	4.57	18.30	0.69	18.99	201
OTC medicine price (h)	4.57	4.20	4.57	18.30	0.69	18.99	201

Note: 'l' denotes low estimate; 'm' denotes mid estimate; 'h' denotes high estimate

TABLE A5.6: GP MONEY COSTS (£) IN EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

First Consultation: P medicine on Rx in GP Appointment (N=176)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Consulting time with GP (l)	9.80	8.30	8.30	29.05	4.15	33.20	1726
Consulting time with GP (m)	14.77	12.50	12.50	43.75	6.25	50.00	2599
Consulting time with GP (h)	19.14	16.20	16.20	56.70	8.10	64.80	3368
Net ingredient cost Rx meds.	9.14	7.80	5.00	32.70	4.40	37.10	1608
First Consultation: P Medicine on Repeat Rx from GP (N=127)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Admin. of posting by GP (l)	0.88	0.88	0.88	0.00	0.88	0.88	18
Admin. of posting by GP (m)	1.48	1.48	1.48	0.00	1.48	1.48	30
Admin. of posting by GP (h)	2.08	2.08	2.08	0.00	2.08	2.08	42
Signing repeat Rx GP (l)	4.15	4.15	4.15	0.00	4.15	4.15	527
Signing repeat Rx GP (m)	6.25	6.25	6.25	0.00	6.25	6.25	794
Signing repeat Rx GP (h)	8.10	8.10	8.10	0.00	8.10	8.10	1029
Net ingredient cost Rx meds	10.65	8.50	6.70	22.30	4.60	26.90	1342
First Consultation: P Medicine Bought OTC at CP (N=882)*							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Consulting time with GP (l)	9.45	8.30	8.30	45.65	4.15	49.50	718
Consulting time with GP (m)	14.23	12.50	12.50	68.75	6.25	75.00	1081
Consulting time with GP (h)	18.44	16.20	16.20	89.10	8.10	97.20	1401
Follow Up Consultation: GP Appointment (N=122)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Consulting time with GP (l)	10.82	8.30	8.30	45.65	4.15	49.50	1320
Consulting time with GP (m)	16.29	12.50	12.50	68.75	6.25	75.00	1988
Consulting time with GP (h)	21.11	16.20	16.20	89.10	8.10	97.20	2576
Net ingredient cost Rx meds.	11.43	8.70	8.70	43.50	8.70	52.20	1166
Follow Up Consultation: CP Consultation (N=44)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Consulting time with GP (l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consulting time with GP (m)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consulting time with GP (h)	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: 'l' denotes low estimate; 'm' denotes mid estimate; 'h' denotes high estimate

* GP consulting costs are reported in this route because as small number of users visited a GP before buying a P medicine over-the-counter from a community pharmacy

TABLE A5.7: CP MONEY COSTS (£) IN EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

First Consultation: P medicine on Rx in GP Appointment (N=176)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Prescription dispensing (l)	0.80	0.80	0.80	0.00	0.80	0.80	141
(m)	1.58	1.58	1.58	0.00	1.58	1.58	277
(h)	2.95	2.95	2.95	0.00	2.95	2.95	519
Prescription advice (l)	0.06	0.06	0.06	0.00	0.06	0.06	11
(m)	0.14	0.14	0.14	0.00	0.14	0.14	24
(h)	0.18	0.18	0.18	0.00	0.18	0.18	32
CP on-cost allowance	1.60	1.37	0.88	5.72	0.77	6.49	281
CP dispensing fee	1.04	0.94	0.94	1.88	0.94	2.82	183
Net ingredient cost Rx meds.	9.14	7.80	5.00	32.70	4.40	37.10	1608
First Consultation: P Medicine on Repeat Rx from GP (N=127)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Repeat Rx dispensing (l)	0.80	0.80	0.80	0.00	0.80	0.80	102
(m)	1.58	1.58	1.58	0.00	1.58	1.58	200
(h)	2.95	2.95	2.95	0.00	2.95	2.95	375
Repeat Rx advice (l)	0.06	0.06	0.06	0.00	0.06	0.06	8
(m)	0.14	0.14	0.14	0.00	0.14	0.14	17
(h)	0.24	0.24	0.24	0.00	0.24	0.24	30
CP on-cost allowance	1.86	1.49	1.17	3.90	0.81	4.71	235
CP dispensing fee	1.16	0.94	0.94	1.88	0.94	2.82	147
Net ingredient cost Rx med.	10.65	8.50	6.70	22.30	4.60	26.90	1342
First Consultation: P Medicine Bought OTC at CP (N=882)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Advice P medicines OTC (l)	0.16	0.16	0.16	0.00	0.16	0.16	141
(m)	0.45	0.45	0.45	0.00	0.45	0.45	397
(h)	1.48	1.48	1.48	0.00	1.48	1.48	1301
Follow Up Consultation: GP Appointment (N=122)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Prescription dispensing (l)	0.80	0.80	0.80	0.00	0.80	0.80	78
(m)	1.58	1.58	1.58	0.00	1.58	1.58	154
(h)	2.95	2.95	2.95	0.00	2.95	2.95	289
Prescription advice (l)	0.06	0.06	0.06	0.00	0.06	0.06	6
(m)	0.14	0.14	0.14	0.00	0.14	0.14	13
(h)	0.24	0.24	0.24	0.00	0.24	0.24	23
Advice P medicines OTC (l)	0.16	0.16	0.16	0.00	0.16	0.16	1
(m)	0.45	0.45	0.45	0.00	0.45	0.45	2
(h)	1.48	1.48	1.48	0.00	1.48	1.48	6
CP on-cost allowance	2.00	1.52	1.52	7.61	1.52	9.13	204
CP dispensing fee	1.24	0.94	0.94	4.70	0.94	5.64	122
Net ingredient cost Rx meds.	11.43	8.70	8.70	43.50	8.70	52.20	1166
Follow Up Consultation: CP Consultation (N=44)							
Activity	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
Advice P medicines OTC (l)	0.16	0.16	0.16	0.00	0.16	0.16	7
(m)	0.45	0.45	0.45	0.00	0.45	0.45	20
(h)	1.48	1.48	1.48	0.00	1.48	1.48	65

Note: 'l' denotes low estimate; 'm' denotes mid estimate; 'h' denotes high estimate

TABLE A5.8: DIFFERENCE IN MEAN TIME COSTS (MINUTES) ACCRUING TO USERS, DEPENDING ON WHETHER THEY VISITED THE GP OR CP FIRST TO OBTAIN THEIR P MEDICINE

Full Sample N=1185							
Variable	**Group**	**N**	**Mean (mins)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	303	67	8.37	.000	37	60
	CP 1st	882	19				
1st cons. rte. excl. S.A.	GP 1st	303	42	24.88	.000	26	30
	CP 1st	882	14				
Follow Up Sample N=718							
Variable	**Group**	**N**	**Mean (mins)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	185	64	9.19	.000	38	58
	CP 1st	532	16				
1st cons. rte. excl. S.A.	GP 1st	185	40	19.65	.000	24	29
	CP 1st	532	14				
No Follow Up Sample N=468							
Variable	**Group**	**N**	**Mean (mins)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	118	73	3.98	.000	25	73
	CP 1st	350	24				
1st cons. rte. excl. S.A.	GP 1st	118	45	15.57	.000	27	35
	CP 1st	350	14				
Revisit Sample N=165							
Variable	**Group**	**N**	**Mean (mins)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	51	64	3.72	.000	23	75
	CP 1st	114	15				
1st & 2nd cons. rte. incl. S.A.	GP 1st	51	175	3.24	.000	30	125
	CP 1st	114	98				
1st cons. rte. excl. SA	GP 1st	51	41	9.30	.000	20	31
	CP 1st	114	15				
1st & 2nd cons. rte. excl. S.A.	GP 1st	51	114	8.38	.000	41	66
	CP 1st	114	61				

TABLE A5.9: DIFFERENCE IN TOTAL MEAN RESOURCE COSTS (£) TO USERS (MID-ESTIMATES) DEPENDING ON WHETHER THEY VISITED THE GP OR CP FIRST TO OBTAIN THEIR P MEDICINE

Full Sample N=1185							
Total Mean Resource Cost*	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	303	9.24	3.273	.001	.8674	.9003
	CP 1st	882	6.62				
1st cons. rte. excl. S.A.	GP 1st	303	6.54	2.278	.023	.07496	1.0052
	CP 1st	882	6.00				
Follow Up Sample N=718							
Total Mean Resource Cost*	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	185	8.71	3.967	.000	1.2586	3.7255
	CP 1st	532	6.22				
1st cons. rte. excl. S.A.	GP 1st	185	6.40	3.004	.003	1.2999	6.2026
	CP 1st	532	5.95				
No Follow Up Sample N=468							
Total Mean Resource Cost*	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	118	10.05	1.585	.114	-.6806	6.3451
	CP 1st	350	7.22				
1st cons. rte. excl. S.A.	GP 1st	118	6.77	1.738	.083	-.0895	1.4581
	CP 1st	350	6.09				
Revisit Sample N=165							
Total Mean Resource Cost*	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	51	8.13	1.262	.209	-.8601	3.9044
	CP 1st	114	6.61				
1st & 2nd cons. rte. incl. S.A.	GP 1st	51	25.71	.611	.542	-5.2647	9.9863
	CP 1st	114	23.35				
1st cons. rte. excl. SA	GP 1st	51	6.17	-.744	.458	-1.6032	.7259
	CP 1st	114	6.61				
1st & 2nd cons. rte. excl. S.A.	GP 1st	51	17.03	.213	.831	-2.4838	3.0850
	CP 1st	114	16.73				

*Total Mean Resource Cost = Mean Time & Travel Cost + Mean Medicine Cost

TABLE A5.10: DIFFERENCE IN MEAN TIME AND TRAVEL COSTS (£) TO USERS (MID-ESTIMATES) DEPENDING ON WHETHER THEY VISITED THE GP OR CP FIRST TO OBTAIN THEIR P MEDICINE

Full Sample N=1185							
Mean Time & Travel Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	303	8.51	7.391	.000	4.2125	7.2571
	CP 1st	882	2.77				
1st cons. rte. excl. S.A.	GP 1st	303	5.82	24.579	.000	3.3641	3.9478
	CP 1st	882	2.16				
Follow Up Sample N=718							
Mean Time & Travel Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	185	7.87	9.587	.000	4.3329	6.5644
	CP 1st	532	2.42				
1st cons. rte. excl. S.A.	GP 1st	185	5.55	19.643	.000	3.0658	3.7467
	CP 1st	532	2.15				
No Follow Up Sample N=468							
Mean Time & Travel Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	118	9.51	3.507	.000	2.7261	9.6748
	CP 1st	350	3.31				
1st cons. rte. excl. S.A.	GP 1st	118	6.23	15.197	.000	3.5246	4.5715
	CP 1st	350	2.18				
Revisit Sample N=165							
Mean Time & Travel Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte. incl. SA	GP 1st	51	7.45	4.399	.000	2.723	7.159
	CP 1st	114	2.51				
1st & 2nd cons. rte. incl. S.A.	GP 1st	51	23.54	2.140	.034	.6115	15.232
	CP 1st	114	15.61				
1st cons. rte. excl. SA	GP 1st	51	5.49	8.257	.000	2.2676	3.6929
	CP 1st	114	2.51				
1st & 2nd cons. rte. excl. S.A.	GP 1st	51	14.85	6.917	.000	4.1882	7.535
	CP 1st	114	8.99				

TABLE A5.11: DIFFERENCE IN MEAN MEDICINE COSTS (£) TO USERS (MID-ESTIMATES) DEPENDING ON WHETHER THEY VISITED THE GP OR CP FIRST TO OBTAIN THEIR P MEDICINE

Full Sample N=1185							
Mean Medicine Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte.	GP 1st	303	0.73	-16.886	.000	-3.4799	-2.7538
	CP 1st	882	3.84				
Follow Up Sample N=718							
Mean Medicine Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte.	GP 1st	185	0.85	12.540	.000	-3.4191	-2.4937
	CP 1st	532	3.80				
No Follow Up Sample N=468							
Mean Medicine Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte.	GP 1st	118	0.54	-11.338	.001	-3.9468	-2.7807
	CP 1st	350	3.90				
Revisit Sample N=165							
Mean Medicine Cost	**Group**	**N**	**Mean (£)**	**t**	**p-value**	**95% CI of Difference**	
						Lower	**Upper**
1st cons. rte.	GP 1st	51	0.68	-7.299	.000	-4.3438	-2.4940
	CP 1st	114	4.10				
1st & 2nd cons. rte.	GP 1st	51	2.18	-5.025	.000	-7.7464	-3.3756
	CP 1st	114	7.74				

TABLE A5.12: SUMMARY OF COMPARISON OF MEAN TIME COSTS (INITIAL CONSULTATION ROUTE ONLY) BY DIFFERENT USE AND USER CHARACTERISTICS

User Characteristics	Full Sample (N=1185)		Follow-Up Sample (N=717)		Revisit Sample (N=165)	
	Excl. SA	Incl. SA	Excl. SA	Incl. SA	Excl. SA	Incl. SA
Demography						
Gender	NS	NS	NS	NS	NS	NS
Ethnic group	NS	NS	NS	NS	NS	NS
Age band	**	*	NS	NS	NS	NS
Marital status	*	NS	***	*	NS	NS
Socio-economic						
Accommodation	****	*	****	*	*	NS
Deprivation cat.	***	***	****	****	*	**
Access car/van	****	***	****	NS	NS	NS
Employmt. Cat.	****	NS	***	NS	*	NS
Level f/t educ.	*	NS	**	NS	*	NS
Health Status						
General health	****	NS	*	NS	****	NS
L/standing illness	****	*	***	NS	***	NS
No. GP cons.	****	*	****	*	***	NS
No. CP cons.	****	****	****	****	NS	NS
Use same CP	*	NS	NS	NS	***	NS
Regular Rx meds.	****	*	****	*	*	NS
Access to GP/CP Services						
Wait to see GP	NS	NS	NS	NS	NS	NS
Distance to GP	**	*	NS	NS	NS	NS
Distance to CP	NS	NS	NS	NS	NS	NS
Cost of Medicines						
Exempt Rx chg.	****	**	****	NS	***	NS
Put off cost meds.	****	****	****	****	*	NS
Type of Medicines						
Deregulated	NS	*	NS	NS	NS	NS
NHS blacklisted	****	***	****	****	***	NS

Significance levels: * p<.05; ** p<.01; *** p<.001; **** p<.0001
SA: Special Arrangements
NS: Not significant

TABLE A5.13: SUMMARY COMPARISONS OF TOTAL AND CONSTITUENT MEAN RESOURCE COSTS (MID-ESTIMATES) ASSOCIATED WITH USERS' INITIAL CONSULTATION ROUTE (EXCLUDING SPECIAL ARRANGEMENT COSTS) BY KEY USE AND USER CHARACTERISTICS

User Characteristics	Full Sample N=1185			Follow-Up Sample N=717		
	User Total Cost	User Time & Travel Cost	User Medicine Cost	User Total Cost	User Time & Travel Cost	User Medicine Cost
Demography						
Gender	NS	NS	NS	NS	NS	NS
Ethnic group	NS	NS	NS	NS	NS	NS
Age band	***	*	****	****	NS	****
Marital status	****	*	****	**	**	****
Socio-economic						
Accommodation	NS	****	****	*	****	****
Deprivation cat.	*	****	****	NS	****	**
Access car/van	*	****	****	NS	***	****
Employmt. cat.	****	****	****	****	***	****
Level f/t educ.	*	*	****	NS	**	****
Health Status						
General health	NS	****	****	NS	**	NS
L/standing illness	NS	****	****	NS	****	****
Use of GP/CP Services in the Last Year						
No. general practitioner cons.	NS	****	****	NS	****	****
No. community pharmacist cons.	NS	****	****	NS	****	****
Use same community pharmacist	NS	*	**	NS	NS	*
Regular Rx meds.	NS	****	****	NS	****	****
Access to GP/CP Services in the Last Year						
Wait to see general practitioner	***	NS	****	*	NS	*
Distance to general practitioner	NS	NS	NS	NS	NS	NS
Distance to community pharmacist	*	NS	NS	*	NS	NS
Cost of Medicines						
Exempt Rx chg.	****	****	****	****	****	****

Put off cost meds.	NS	****	*	NS	****	NS
Type of Medicines						
Deregulated	****	NS	****	****	NS	***
NHS blacklisted	***	****	*	**	****	NS

Significance levels: * p<.05; ** p<.01; *** p<.001; **** p<.0001
SA: Special Arrangements
NS: Not significant

TABLE A5.14: SUMMARY OF COMPARISONS OF TOTAL AND CONSTITUENT MEAN MONEY COSTS (MID-ESTIMATES) ASSOCIATED WITH USERS' INITIAL CONSULTATION ROUTE (INCLUDING SPECIAL ARRANGEMENT COSTS) BY KEY USE AND USER CHARACTERISTICS

User Characteristics	Full Sample N=1185			Follow-Up Sample N=717		
	User Total Cost	User Time & Travel Cost	User Medicine Cost	User Total Cost	User Time & Travel Cost	User Medicine Cost
Demography						
Gender	NS	NS	NS	NS	NS	NS
Ethnic group	NS	NS	NS	NS	NS	NS
Age band	*	**NS**	****	***	NS	****
Marital status	**NS**	**NS**	****	*	*	****
Socio-economic						
Accommodation	NS	**NS**	****	**NS**	*	****
Deprivation cat.	**NS**	*	****	*	***	**
Access car/van	**NS**	**	****	NS	**NS**	****
Employmt. cat.	**NS**	**NS**	****	**	**NS**	****
Level f/t educ.	**NS**	**NS**	****	NS	**NS**	****
Health Status						
General health	NS	**NS**	****	NS	**NS**	NS
L/standing illness	NS	*	****	NS	**NS**	****
Use of GP/CP Services in the Last Year						
No. GP cons.	NS	**NS**	****	NS	*	****
No. CP cons.	*	****	****	**	****	****
Use same CP	NS	**NS**	**	NS	NS	*
Regular Rx meds.	NS	**NS**	****	NS	*	****
Access to GP/CP Services in the Last Year						
Wait to see GP	**NS**	NS	****	**NS**	NS	*
Distance to GP	NS	NS	NS	NS	NS	NS
Distance to CP	**NS**	NS	NS	**NS**	NS	NS
Cost of Medicines						
Exempt Rx chg.	**NS**	*	****	****	**NS**	****
Put off cost meds.	*	**	*	****	****	NS
Type of Medicines						
Deregulated	****	*	****	***	NS	***
NHS blacklisted	*	**	*	**	****	NS

Significance levels: * p<.05; ** p<.01; *** p<.001; **** p<.0001
SA: Special Arrangements
NS: Not significant

TABLE A5.15: SUMMARY TIME COSTS (MINUTES) ACCRUING TO KEY STAKEHOLDERS ACROSS INITIAL AND FOLLOW-UP CONSULTATION ROUTES

Full Sample (N=1185)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	**44**	15	10	1775	5	1780	**52314 (872)**
User (excl. special arrangement time)	**29**	15	10	205	5	210	**33954 (566)**
General practitioner (GP)	**11**	10	10	80	0	80	**5169 (86)**
Community pharmacist (CP)	**2**	1	1	7	1	8	**2541 (42)**
National Health Service (NHS)	**7**	1	1	87	1	88	**7710 (129)**
Follow-Up Sample (N=718)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	**49**	15	10	1220	5	1225	**35320 (589)**
User (excl. special arrangement time)	**33**	15	10	205	5	210	**23560 (393)**
General practitioner (GP)	**11**	10	10	80	0	80	**3635 (61)**
Community pharmacist (CP)	**2**	1	1	7	1	8	**1743 (29)**
National Health Service (NHS)	**8**	1	1	87	1	88	**5378 (90)**
No Telephone Follow-Up Sample (N=467)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	**36**	10	10	1775	5	1780	**16994 (283)**
User (excl. special arrangement time)	**22**	10	10	125	5	130	**10394 (173)**
General practitioner (GP)	**10**	10	5	55	5	60	**1534 (26)**
Community pharmacist (CP)	**2**	1	1	3	1	4	**798 (13)**
National Health Service (NHS)	**5**	1	1	60	1	61	**2332 (39)**
GP Only Sample (N=134)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	**64**	38	30	1000	10	1010	**8550 (143)**
User (excl. special arrangement time)	**40**	35	30	105	10	115	**5310 (89)**
General practitioner (GP)	**9**	5	5	25	5	30	**1175 (20)**
Community pharmacist (CP)	**4**	4	4	0	4	4	**509 (8)**

National Health Service (NHS)	13	9	9	25	9	34	1684 (28)
CP Only Sample (N=418)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	16	10	10	310	5	315	6685 (111)
User (excl. special arrangement time)	13	10	10	90	5	95	5485 (91)
General practitioner (GP)	0	0	0	0	0	0	0 (0)
Community pharmacist (CP)	1	1	1	0	1	1	418 (7)
National Health Service (NHS)	2	1	1	60	1	61	713 (12)
GP to GP Sample (N=46)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	188	138	60	1175	50	1225	8650 (144)
User (excl. special arrangement time)	120	120	60	160	50	210	5530 (92)
General practitioner (GP)	22	20	15	70	10	80	1010 (17)
Community pharmacist (CP)	8	8	8	0	8	8	350 (6)
National Health Service (NHS)	30	28	23	70	18	88	1360 (23)
GP to CP Sample (N=5)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	57	65	65	30	40	70	285 (5)
User (excl. special arrangement time)	57	65	65	30	40	70	285 (5)
General practitioner (GP)	8	10	10	5	5	10	40 (1)
Community pharmacist (CP)	5	5	5	0	5	5	24 (-)
National Health Service (NHS)	13	15	15	5	10	15	64 (1)
CP to GP Sample (N=76)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	130	80	80	620	20	640	9845 (164)
User (excl. special arrangement time)	76	70	45	155	20	175	5765 (96)
General practitioner (GP)	14	10	10	35	5	40	1070 (18)
Community pharmacist (CP)	5	5	5	1	5	6	366 (6)

National Health Service (NHS)	**19**	15	15	35	10	45	**1436 (24)**
CP to CP Sample (N=39)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum (Hrs)**
User (incl. special arrangement time)	**36**	35	15	125	10	135	**1405 (23)**
User (excl. special arrangement time)	**33**	30	15	90	10	100	**1285 (21)**
General practitioner (GP)	**0**	0	0	0	0	0	**0 (0)**
Community pharmacist (CP)	**2**	2	2	4	2	6	**82 (1)**
National Health Service (NHS)	**4**	2	2	15	2	17	**137 (2)**

Note: the key figures of interest are the mean and total time costs accruing to users. These are highlighted in bold. Other summary statistics are included as a reference source for future researchers interested in costing the provision of P medicines in primary care.

TABLE A5.16: AVERAGE RESOURCE COSTS (£) ACCRUING TO KEY STAKEHOLDERS ACROSS VARIED COMPLETE CONSULTATION ROUTES (N=718) LOW, MID AND HIGH ESTIMATES

User consultation route		N	User Cost	General Practitioner Cost	Community Pharmacist Cost	Total Cost
First Consultation	Follow-up Consultation					
Community Pharmacist	**None**	418	4.76	0.00	0.16	**4.92**
			5.77	0.00	0.45	**6.22**
			6.39	0.00	1.48	**7.87**
Community Pharmacist	**Community Pharmacist**	39	12.26	0.00	0.61	**12.83**
			14.69	0.00	1.19	**15.88**
			16.13	0.00	3.25	**19.38**
General Practitioner	**None**	134	3.77	7.37	13.50	**24.64**
			6.49	11.12	14.35	**31.96**
			8.03	14.42	15.79	**38.24**
General Practitioner	**Community Pharmacist**	5	8.73	6.64	8.36	**23.73**
			12.60	10.00	9.49	**32.09**
			14.76	12.96	11.96	**39.68**
Community Pharmacist	**General Practitioner**	76	12.65	11.69	12.20	**36.54**
			17.93	17.60	12.57	**48.10**
			20.93	22.81	13.74	**57.48**
General Practitioner	**General Practitioner**	46	9.78	18.24	27.29	**55.31**
			17.51	27.48	28.20	**73.19**
			21.63	35.61	29.72	**86.96**

TABLE A5.17: SUMMARY RESOURCE COSTS (£) ACCRUING TO KEY STAKEHOLDERS ACROSS INITIAL AND FOLLOW UP CONSULTATION ROUTES

Full Sample (N=1185)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	6.72	4.39	4.29	155.46	0.30	155.76	7961
User incl. Special arr. (m)	9.66	5.68	4.39	290.76	0.60	291.36	11444
User incl. Special arr. (h)	11.34	6.49	6.00	362.45	0.75	363.20	13439
User excl. special arr. (l)	5.57	4.29	4.29	57.30	0.30	57.60	6597
User excl. special arr. (m)	7.58	5.59	4.39	68.20	0.60	68.80	8987
User excl. special arr. (h)	8.74	6.39	6.00	74.45	0.75	75.20	10360
General practitioner (l)	8.99	8.30	8.30	66.40	0.00	66.40	4308
General practitioner (m)	13.55	12.50	12.50	100.00	0.00	100.00	6491
General practitioner (h)	17.57	16.20	16.20	129.60	0.00	129.60	8415
Community pharmacist (l)	4.81	0.16	0.16	93.36	0.16	93.52	5704
Community pharmacist (m)	5.26	0.45	0.45	93.99	0.45	94.44	6237
Community pharmacist (h)	6.45	1.48	1.48	94.48	1.48	95.96	7638
National Health Service (l)	20.61	18.76	8.30	109.96	0.16	110.12	9871
National Health Service (m)	25.74	23.38	12.50	139.47	0.45	139.92	12331
National Health Service (h)	30.80	27.60	16.20	169.56	1.48	171.04	14752
Follow-Up Sample (N=718)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	7.47	4.65	4.29	78.64	0.60	79.24	5353
User incl. Special arr. (m)	10.78	6.15	3.79	130.60	1.20	131.80	7726
User incl. Special arr. (h)	12.70	6.95	4.50	160.94	1.50	162.74	9106
User excl. special arr. (l)	6.14	4.55	4.29	57.00	0.60	57.60	4405
User excl. special arr. (m)	8.45	6.00	3.79	67.60	1.20	68.80	6057
User excl. special arr. (h)	9.77	6.90	4.50	73.70	1.50	75.20	7006
General practitioner (l)	9.27	8.30	8.30	66.40	0.00	66.40	3030
General practitioner (m)	13.96	12.50	12.50	100.00	0.00	100.00	4566
General practitioner (h)	18.10	16.20	16.20	129.60	0.00	129.60	5920
Community pharmacist (l)	5.74	0.16	0.16	93.36	0.16	93.52	4113
Community pharmacist (m)	6.20	0.45	0.45	93.99	0.45	94.44	4444
Community pharmacist (h)	7.41	1.48	1.48	94.48	1.48	95.96	5315
National Health Service (l)	21.58	19.53	0.16	109.96	0.16	110.12	7058
National Health Service (m)	26.82	23.80	0.45	139.47	0.45	139.92	8771
National Health Service (h)	31.96	27.60	1.48	169.56	1.48	171.04	10457
No Telephone Follow-Up Sample (N=467)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	5.57	4.19	3.79	155.46	0.30	155.76	2608
User incl. Special arr. (m)	7.94	5.31	4.39	290.76	0.60	291.36	3718
User incl. Special arr. (h)	9.26	5.99	6.00	362.45	0.75	363.20	4333
User excl. special arr. (l)	4.68	4.09	3.79	20.30	0.30	20.60	2192
User excl. special arr. (m)	6.26	5.20	4.39	21.60	0.60	22.20	2929
User excl. special arr. (h)	7.17	5.95	6.00	24.54	0.75	25.29	3354
General practitioner (l)	8.41	8.30	4.15	45.65	4.15	49.80	1278
General practitioner (m)	12.66	12.50	6.25	68.75	6.25	75.00	1925
General practitioner (h)	16.42	16.20	8.10	89.10	8.10	97.20	2495
Community pharmacist (l)	3.40	0.16	0.16	35.13	0.16	35.29	1592
Community pharmacist (m)	3.83	0.45	0.45	35.69	0.45	26.14	1793
Community pharmacist (h)	4.96	1.48	1.48	36.14	1.48	37.61	2322
National Health Service (l)	18.51	16.60	8.30	48.71	4.15	52.86	2813
National Health Service (m)	23.42	21.65	12.50	68.75	6.25	75.00	3560

National Health Service (h)	28.30	26.15	16.20	89.10	8.10	97.20	4301
GP Only Sample (N=134)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	5.12	2.90	0.60	65.32	0.60	65.92	687
User incl. Special arr. (m)	8.94	5.80	1.20	129.32	1.20	130.52	1198
User incl. Special arr. (h)	11.12	7.50	1.50	157.40	1.50	158.90	1490
User excl. special arr. (l)	3.77	2.70	0.60	19.40	0.60	20.00	505
User excl. special arr. (m)	6.49	5.40	1.20	21.40	1.20	22.60	869
User excl. special arr. (h)	8.03	6.90	1.50	22.80	1.50	24.30	1076
General practitioner (l)	7.37	5.03	4.15	20.75	4.15	24.90	988
General practitioner (m)	11.12	7.73	6.25	31.25	6.25	37.50	1489
General practitioner (h)	14.42	10.18	8.10	40.50	8.10	48.60	1933
Community pharmacist (l)	13.50	10.97	6.97	40.30	6.97	47.28	1809
Community pharmacist (m)	14.35	11.82	7.82	40.30	7.82	48.12	1922
Community pharmacist (h)	15.79	13.29	9.24	40.30	9.24	49.54	2116
National Health Service (l)	20.87	18.76	11.12	44.65	11.12	55.58	2797
National Health Service (m)	25.46	23.15	14.07	46.55	14.07	60.62	3412
National Health Service (h)	30.21	28.14	17.34	53.19	17.34	70.53	4048
CP Only Sample (N=418)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	4.92	4.12	4.29	29.60	1.09	30.69	2057
User incl. Special arr. (m)	6.11	4.95	3.79	39.88	1.69	41.57	2554
User incl. Special arr. (h)	6.81	5.55	3.74	49.09	1.85	50.94	2848
User excl. special arr. (l)	4.76	4.05	4.29	29.60	1.09	30.69	1988
User excl. special arr. (m)	5.77	4.89	3.79	31.30	1.69	32.99	2412
User excl. special arr. (h)	6.39	5.52	3.74	32.69	1.85	34.54	2673
General practitioner (l)	0.00	0.00	0.00	0.00	0.00	0.00	0
General practitioner (m)	0.00	0.00	0.00	0.00	0.00	0.00	0
General practitioner (h)	0.00	0.00	0.00	0.00	0.00	0.00	0
Community pharmacist (l)	0.16	0.16	0.16	0.00	0.16	0.16	67
Community pharmacist (m)	0.45	0.45	0.45	0.00	0.45	0.45	188
Community pharmacist (h)	1.48	1.48	1.48	0.00	1.48	1.48	617
National Health Service (l)	8.90	8.46	8.46	45.65	4.31	49.96	312
National Health Service (m)	13.62	12.95	12.95	68.75	6.70	75.45	557
National Health Service (h)	18.55	17.68	17.68	89.10	9.58	98.68	1095
GP to GP Sample (N=46)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	15.60	9.15	5.70	75.64	3.60	79.24	718
User incl. Special arr. (m)	27.14	18.30	11.40	115.84	7.20	123.04	1248
User incl. Special arr. (h)	33.84	22.73	12.75	149.15	9.00	158.15	1557
User excl. special arr. (l)	9.78	8.35	5.70	54.00	3.60	57.60	450
User excl. special arr. (m)	17.51	16.45	11.40	61.60	7.20	68.80	806
User excl. special arr. (h)	21.63	20.40	12.75	66.20	9.00	75.20	995
General practitioner (l)	18.24	16.60	16.60	58.10	8.30	66.40	839
General practitioner (m)	27.48	25.00	25.00	87.50	12.50	100.00	1264
General practitioner (h)	35.61	32.40	32.40	113.40	6.20	129.60	1638
Community pharmacist (l)	27.29	22.61	20.90	85.96	7.56	93.52	1255
Community pharmacist (m)	28.20	23.52	21.82	86.03	8.41	94.44	1297
Community pharmacist (h)	29.72	25.07	23.34	86.13	9.83	95.96	1367
National Health Service (l)	45.54	41.25	35.47	90.03	20.09	110.12	2095
National Health Service (m)	55.68	49.93	42.69	114.78	25.14	139.92	2562
National Health Service (h)	65.34	59.55	49.81	140.72	30.31	171.04	3005
GP to CP Sample (N=5)							

Stakeholder	Mean	Median	Mode	Range	Min	Max	Sum
User incl. Special arr. (l)	8.73	8.77	7.35	2.65	7.35	10.00	44
User incl. Special arr. (m)	12.60	12.97	10.55	3.10	10.55	13.65	63
User incl. Special arr. (h)	14.76	15.07	12.55	4.25	12.55	16.80	74
User excl. special arr. (l)	8.73	8.77	7.35	2.65	7.35	10.00	44
User excl. special arr. (m)	12.60	12.97	10.55	3.10	10.55	13.65	63
User excl. special arr. (hi	14.76	15.07	12.55	4.25	12.55	16.80	74
General practitioner (l)	6.64	8.30	8.30	4.15	4.15	8.30	33
General practitioner (m)	10.00	12.50	12.50	6.25	6.25	12.50	50
General practitioner (h)	12.96	16.20	16.20	8.10	8.10	16.20	65
Community pharmacist (l)	8.36	7.72	7.72	3.76	7.37	11.13	42
Community pharmacist (m)	9.49	8.86	8.86	3.76	8.50	12.26	47
Community pharmacist (h)	11.96	11.36	11.36	3.76	10.95	14.71	60
National Health Service (l)	14.97	15.67	11.87	7.56	11.87	19.43	75
National Health Service (m)	19.49	21.00	15.11	9.66	15.11	24.76	97
National Health Service (h)	24.92	27.16	19.46	11.45	19.46	30.92	125
CP to GP Sample (N=76)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	18.23	13.62	6.95	74.65	4.35	79.00	1386
User incl. Special arr. (m)	27.67	19.10	10.35	124.25	7.55	131.80	2103
User incl. Special arr. (h)	33.18	21.90	15.95	153.09	9.35	162.44	2522
User excl. special arr. (l)	12.65	12.14	6.95	33.80	4.35	38.15	962
User excl. special arr. (m)	17.93	17.09	10.35	36.00	7.55	43.55	1363
User excl. special arr. (h)	20.93	19.72	15.95	36.90	9.35	46.25	1591
General practitioner (l)	11.69	8.30	8.30	29.05	4.15	33.20	888
General practitioner (m)	17.60	12.50	12.50	43.75	6.25	50.00	1338
General practitioner (h)	22.81	16.20	16.20	56.70	8.10	64.80	1733
Community pharmacist (l)	12.20	11.39	11.39	55.80	0.16	56.04	927
Community pharmacist (m)	12.57	11.75	11.75	55.95	0.45	56.40	955
Community pharmacist (h)	13.74	12.87	12.87	56.05	1.48	57.52	1044
National Health Service (l)	23.73	19.53	19.53	60.03	4.15	64.18	1803
National Health Service (m)	29.72	25.00	25.00	62.20	6.25	68.45	2258
National Health Service (h)	35.97	32.40	32.40	68.10	8.10	76.20	2666
CP to CP Sample (N=39)							
Stakeholder	**Mean**	**Median**	**Mode**	**Range**	**Min**	**Max**	**Sum**
User incl. Special arr. (l)	12.44	10.13	7.34	37.90	3.98	41.88	485
User incl. Special arr. (m)	15.07	12.99	10.38	39.60	6.18	45.78	588
User incl. Special arr. (h)	16.60	14.39	10.75	40.29	7.44	47.73	647
User excl. special arr. (l)	12.26	10.13	7.34	37.90	3.98	41.88	478
User excl. special arr. (m)	14.69	12.99	10.38	39.60	6.18	45.78	573
User excl. special arr. (h)	16.13	14.39	10.75	40.29	7.44	47.73	629
General practitioner (l)	0.00	0.00	0.00	0.00	0.00	0.00	0
General practitioner (m)	0.00	0.00	0.00	0.00	0.00	0.00	0
General practitioner (h)	0.00	0.00	0.00	0.00	0.00	0.00	0
Community pharmacist (l)	0.61	0.32	0.32	11.23	0.32	11.55	24
Community pharmacist (m)	1.19	0.90	0.90	11.30	0.90	12.20	46
Community pharmacist (h)	3.25	2.96	2.96	11.40	2.96	14.35	127
National Health Service (l)	1.62	0.16	0.16	19.53	0.16	19.69	63
National Health Service (m)	2.50	0.45	0.45	23.80	0.45	24.25	98
National Health Service (h)	4.06	1.48	1.48	27.60	1.48	29.08	158

Note: 'l' denotes low estimate; 'm' denotes mid estimate; 'h' denotes high estimate

TABLE A5.18: PROPORTIONAL TIME COSTS (MINUTES) ACCRUING TO KEY STAKEHOLDERS FOR EACH OF THE INITIAL AND FOLLOW-UP CONSULTATION ROUTES

Initial & Follow-Up Consultation Routes	
Stakeholder	**% Including Special Arrangements**
User	89
General practitioner	7
Community pharmacist	4
Initial Consultation Routes Only	
Stakeholder	**% Including Special Arrangements**
User	89
General practitioner	6
Community pharmacist	5
Follow-Up Consultation Routes Only	
Stakeholder	**% Including Special Arrangements**
User	88
General practitioner	9
Community pharmacist	3
First Consultation: P medicine on Rx in GP Appointment (N=176)	
Stakeholder	**% Including Special Arrangements**
User	84
General practitioner	12
Community pharmacist	4
First Consultation: P Medicine on Repeat Rx from GP (N=127)	
Stakeholder	**% Including Special Arrangements**
User	85
General practitioner	8
Community pharmacist	6
First Consultation: P Medicine Bought OTC at CP (N=882)	
Stakeholder	**% Including Special Arrangements**
User	95
General practitioner	-
Community pharmacist	5
Follow-up Consultation: GP Appointment (N=122)	
Stakeholder	**% Including Special Arrangements**
User	87
General practitioner	10
Community pharmacist	3
Follow-up Consultation: CP Consultation (N=44)	
Stakeholder	**% Including Special Arrangements**
User	95
General practitioner	-
Community pharmacist	5

TABLE A5.19: PROPORTION TOTAL TIME COST INCURRED BY USERS BY CONSTITUENT CONSULTATION ELEMENT

First Consultation: P medicine on Rx in GP Appointment (N=176)		
Activity	**% Total Time (Incl. Special Arrangements)**	**% Total Time (Excl. Special Arrangements)**
Waiting time in GP surgery	17	26
Consulting time with GP	15	23
Travel time to GP surgery	13	20
Special arrgmt. time attend GP	21	-
Travel time to CP	11	16
Waiting time at CP	10	15
Special arrgmt. time attend CP	13	-
First Consultation: P Medicine on Repeat Rx from GP (N=127)		
Activity	**% Total Time (Incl. Special Arrangements)**	**% Total Time (Excl. Special Arrangements)**
Travel time to GP surgery	20	36
Waiting time in GP surgery	4	8
Special arrgmt. time attend GP	24	-
Travel time to CP	19	34
Waiting time at CP	12	22
Special arrgmt. time attend CP	20	-
First Consultation: P Medicine Bought OTC at CP (N=882)		
Activity	**% Total Time (Incl. Special Arrangements)**	**% Total Time (Excl. Special Arrangements)**
Travel time to CP	55	75
Waiting time at CP	2	3
Special arrgmt. time attend CP	12	-
Waiting time in GP surgery	6	8
Consulting time with GP	5	7
Travel time to GP surgery	5	7
Special arrgmt. time attend GP	15	-
Follow Up Consultation: GP Appointment (N=122)		
Activity	**% Total Time (Incl. Special Arrangements)**	**% Total Time (Excl. Special Arrangements)**
Waiting time in GP surgery	24	42
Consulting time with GP	11	19
Travel time to GP surgery	10	17
Special arrgmt. time attend GP	37	-
Travel time to CP	5	9
Waiting time at CP	7	12
Special arrgmnt. time attend CP	5	-
Follow Up Consultation: CP Consultation (N=44)		
Activity	**% Total Time (Incl. Special Arrangements)**	**% Total Time (Excl. Special Arrangements)**
Travel time to CP	63	74
Waiting time at CP	22	26
Special arrgmt. time attend CP	15	-

TABLE A5.20: PROPORTIONAL RESOURCE COSTS (£) ACCRUING TO KEY STAKEHOLDERS ACROSS VARIED CONSULTATION ROUTES

Initial & Follow-Up Consultation Routes						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	46	50	49	40	41	38
General Practitioner	21	23	24	23	27	30
Community Pharmacist	33	27	27	37	32	32
Initial Consultation Routes Only						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	49	52	49	46	46	43
General Practitioner	18	20	22	19	23	24
Community Pharmacist	33	28	29	35	31	33
Follow-Up Consultation Routes only						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	38	44	45	22	23	23
General Practitioner	29	32	34	36	43	48
Community Pharmacist	33	24	21	42	33	29
First Consultation: P Medicine on Rx in GP Appointment (N=176)						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	21	27	28	17	18	17
General Practitioner	35	38	41	36	43	47
Community Pharmacist	44	35	32	47	39	36
First Consultation: P Medicine on Repeat Rx from GP (N=127)						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	19	26	27	13	18	19
General Practitioner	19	22	24	20	24	27
Community Pharmacist	62	52	48	67	57	54
First Consultation: P Medicine Bought OTC at CP (N=882)						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	97	94	83	97	93	82
General Practitioner	-	-	-	-	-	-
Community Pharmacist	3	6	17	13	7	18
Follow-Up Consultation: GP Appointment (N=122)						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	35	42	43	16	18	18
General Practitioner	31	33	36	39	47	52
Community Pharmacist	34	25	21	45	35	30
Follow-Up Consultation: CP Consultation (N=44)						
Stakeholder	% Including Spec. Arr.			% Excluding Spec. Arr.		
	Low	Mid	High	Low	Mid	High
User	97	94	84	97	94	84
General Practitioner	-	-	-	-	-	-
Community Pharmacist	3	6	16	3	6	16

TABLE A5.21: PROPORTION OF TOTAL RESOURCE COST INCURRED BY USERS BY CONSTITUENT CONSULTATION ELEMENT

First Consultation: P medicine on Rx in GP Appointment (N=176)						
Activity	% Total Time (Incl. Special Arrangements)			% Total Time (Excl. Special Arrangements)		
	Low	Mid	High	Low	Mid	High
Waiting time in GP surgery	14	16	16	19	21	21
Consulting time with GP	12	14	14	16	18	18
Travel method to GP	4	4	5	5	5	6
Travel time to GP surgery	10	12	12	14	16	16
Special arrangemt. attend GP	16	15	15	-	-	-
Travel method to CP	2	3	3	3	3	4
Travel time to CP	9	10	10	12	13	13
Waiting time at CP	8	9	9	11	12	12
Special arrangemt. attend CP	11	10	10	-	-	-
Prescription fee	14	8	6	19	11	9
First Consultation: P Medicine on Repeat Rx from GP (N=127)						
Activity	% Total Time (Incl. Special Arrangements)			% Total Time (Excl. Special Arrangements)		
	Low	Mid	High	Low	Mid	High
Travel method to GP	4	5	5	7	7	8
Travel time to GP surgery	14	16	16	22	25	26
Waiting time in GP surgery	3	4	3	5	5	5
Special arrangemt. attend GP	13	14	14	-	-	-
Travel method to CP	8	7	8	13	12	13
Travel time to CP	13	15	15	20	24	24
Waiting time at CP	9	10	10	13	15	16
Special arrangemt. attend CP	23	22	22	-	-	-
Prescription fee	13	7	6	20	11	9
First Consultation: P Medicine Bought OTC at 2CP (N=882)						
Activity	% Total Time (Incl. Special Arrangements)			% Total Time (Excl. Special Arrangements)		
	Low	Mid	High	Low	Mid	High
Travel method to CP	5	7	10	5	7	10
Travel time to CP	12	19	21	13	21	23
Waiting time at CP	-	1	1	1	1	1
Special arrangemt. attend CP	2	4	4	-	-	-
Waiting time at GP	1	2	2	1	2	2
Consulting time with GP	1	2	2	1	2	2
Travel method to GP	1	1	1	1	1	1
Travel time to GP surgery	1	2	2	1	2	2
Special arrangemt. attend GP	3	5	6	-	-	-
OTC medicine price	73	50	52	78	64	58
Follow Up Consultation: GP Appointment (N=122)						
Activity	% Total Time (Incl. Special Arrangements)			% Total Time (Excl. Special Arrangements)		
	Low	Mid	High	Low	Mid	High
Waiting time in GP surgery	16	17	17	24	29	30
Consulting time with GP	7	8	8	11	14	17
Travel method to GP	4	3	4	6	6	7
Travel time to GP surgery	7	7	7	10	12	12
Special arrangemt. time GP	29	40	41	-	-	-
OTC medicine price	1	1	1	2	1	1
Travel method to CP	1	1	1	1	2	2

Travel time to CP	4	4	4	5	7	7
Waiting time at CP	5	5	5	7	9	9
Special arrangemt. attend CP	3	3	3	-	-	-
Prescription fee	22	12	9	33	21	17

Follow Up Consultation: CP Consultation (N=44)

Activity	% Total Time (Incl. Special Arrangements)			% Total Time (Excl. Special Arrangements)		
	Low	**Mid**	**High**	**Low**	**Mid**	**High**
Travel method to CP	3	5	7	4	6	8
Travel time to CP	12	20	22	12	21	23
Waiting time at CP	4	7	8	4	7	8
Special arrangemt. time CP	3	5	5	-	-	-
OTC medicine price	77	63	57	80	67	60

TABLE A5.22: PROPORTION OF TOTAL RESOURCE COST INCURRED BY GPS BY CONSTITUENT CONSULTATION ELEMENT

First Consultation: P medicine on Rx in GP Appointment (N=176)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
Consulting time	52	62	68	100	100	100
NIC of medicines	48	38	32	-	-	-
First Consultation: P Medicine on Repeat Rx from GP (N=127)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
NIC of medicines	71	62	55	-	-	-
Admin. of repeat prescriptions	1	1	2	3	4	4
Signing repeat prescriptions	28	37	43	97	96	96
First Consultation: P Medicine Bought OTC at CP (N=882)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
No GP costs incurred	-	-	-	-	-	-
Follow Up Consultation: GP Appointment (N=122)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
Consulting time	53	63	69	100	100	100
NIC of medicines	47	37	31	-	-	-
Follow Up Consultation: CP Consultation (N=44)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
No GP costs incurred	-	-	-	-	-	-

Note: NIC=Net Ingredient Cost

TABLE A5.23: PROPORTION OF TOTAL RESOURCE COST INCURRED BY CPS BY CONSTITUENT CONSULTATION ELEMENT

First Consultation: P medicine on Rx in GP Appointment (N=176)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
Prescription dispensing	6	12	20	23	36	51
Prescription advice	1	1	1	2	3	3
On-cost allowance	13	12	11	46	37	28
Dispensing fee	8	8	7	30	24	18
NIC of prescription medicines	72	68	61	-	-	-
First Consultation: P Medicine on Repeat Rx from GP (N=127)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
Repeat prescription dispensing	6	10	18	21	33	48
Repeat prescription advice	-	1	1	2	3	4
On-cost allowance	13	12	11	48	39	30
Dispensing fee	8	8	7	30	25	19
NIC of prescription medicines	73	69	63	-	-	-
First Consultation: P Medicine Bought OTC at CP (N=882)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
OTC medicine advice	100	100	100	100	100	100
Follow Up Consultation: GP Appointment (N=122)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
Prescription dispensing	5	9	16	19	31	45
Prescription advice	-	1	1	1	3	4
On-cost allowance	13	12	11	50	41	32
Dispensing fee	8	7	7	30	25	19
NIC of prescription medicines	74	70	64	-	-	-
Follow Up Consultation: CP Consultation (N=44)						
Activity	% Total Money (Incl. NIC of Rx Medicines)			% Total Money (Excl. NIC of Rx Medicines)		
	Low	Mid	High	Low	Mid	High
OTC medicine advice	100	100	100	100	100	100

Note: NIC=Net Ingredient Cost

TABLE A5.24: MODELLED RESOURCE SAVINGS ACCRUING TO KEY STAKEHOLDERS WHEN USERS SWITCHED THEIR INITIAL CONSULTATION ROUTE TO THE ALTERNATE ONE

Resource savings: switching from general practitioner to community pharmacy first consultation routes (N=303)						
Stakeholder/ Perspective	**Total resource savings (£)**			**Ave. resource saving Per user (£)**		
	Low	**Mid**	**High**	**Low**	**Mid**	**High**
User	-520	18	301	-1.71	0.06	0.99
General practitioner	2271	3422	4438	7.49	11.29	14.64
Community pharmacist	4010	4179	4308	13.23	13.79	14.21
Society	**5761**	**7619**	**9047**	**19.01**	**25.14**	**29.85**
Resource savings: switching from community pharmacy to general practice first consultation routes (N=882)						
Stakeholder/ Perspective	**Total resource costs (£)**			**Ave. resource cost Per user (£)**		
	Low	**Mid**	**High**	**Low**	**Mid**	**High**
User	-1303	-2888	-3720	-1.48	-3.27	-4.22
General practitioner	-6214	-9371	-12158	-7.04	-10.62	-13.78
Community pharmacist	-11797	-12291	-12665	-13.37	-13.94	-14.36
Society	**-19314**	**-24550**	**-28543**	**-21.90**	**-27.83**	**-32.36**